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DESCRIPTIVE CATALOGUE

OF THE

ANATOMICAL AND PATHOLOGICAL

Museum

OF THE

DUBLIN SCHOOL OF MEDICINE,

PETER-STREET.

BY

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INTRODUCTION.

IN order that that the Student of Medicine should derive as much information as possible from an Anatomical and Pathological Museum, it is essential that he should be enabled not only to know what preparations it contains, but to find, with facility, any specimen to which he may have occasion to refer. For this reason, in the present Museum and Catalogue, the most simple possible arrangement has been adopted, in preference to the complicated ones necessary in more extensive collections. A few words will explain the plan made use of.

A single letter marks the class or organ to which a preparation belongs, (thus, the organs of digestion are marked E.) ; to this is added a figure which distinguishes it from others contained in the same class. Spaces have been left between the numbers to allow additions to be made, and even when they are filled up, new preparations can be added by placing an *Italic* letter after the number : (thus, H. 6*a*. H. 6*b*.) In this manner, between each number, additions can be made without difficulty or confusion, and the Museum may be increased twenty-six fold without altering the present letters or figures.

In the Anatomical department the animals have been described in order, commencing with the lowest, and ending with the highest classes. Cuvier's classification has been adopted, being that most frequently in use in works on Natural History, and therefore most likely to be familiar to the medical student; and in order to save the student the trouble of reference, an abstract of his classification has been appended to this Catalogue, and an example of each class has been added, principally taken from animals mentioned in the Catalogue and contained in the Museum. In all cases the healthy and diseased organs have been placed in as close proximity as possible, to enable the student to estimate the alterations produced by disease in different structures; and a short description of most of the preparations has been given, not to supply the place of more extended works on the subject, but merely to direct the student's attention to the several points exhibited in each specimen.

The first formation of this Museum is due to my esteemed and learned predecessor, Professor Hargrave, by whom about four hundred specimens were prepared; the remainder have been added by myself. In this task I have been most kindly assisted by valuable contributions from friends whose names are specified in the Catalogue, and to whom I take this opportunity of returning my most sincere thanks, and of assuring them, that as the best proof of the value I place on their contributions, I have spared neither time nor expense in preparing or preserving them.

With the Medical Students of Dublin I have been for many years intimately acquainted; from them I have received many acts of the most disinterested kindness, and for them this Museum has been arranged. Should it be instrumental in giving them a taste for Anatomy and Pathology—should it impel them to seek for more extended information from other sources, I will consider my time well employed, and my labour amply repaid.

ABSTRACT
OF
CUVIER'S CLASSIFICATION OF ANIMALS.

FOUR DIVISIONS.

VERTEBRATA,
MOLLUSCA,

ARTICULATA,
RADIATA.

VERTEBRATA.

CLASS I.—MAMMALIA.

Order.	Examples.
1. Bimana.....	Man.
2. Quadrumana.....	Monkey.
3. Sarcophaga.....	Dog, Cat, Hedgehog.
4. Rodentia.....	Capybara, Rat, Hare.
5. Edentata.....	Armadillo.
6. Pachydermata.....	Horse, Pig.
7. Ruminantia.....	Camel, Ox, Sheep.
8. Amphibia.....	Seal.
9. Cetacea.....	Porpoise.

CLASS II.—AVES.

Order.	Examples.
1. Accipitres.....	Hawk, Owl.
2. Passeres.....	Sparrow.
3. Scansores.....	Parrot, Cockatoo.
4. Gallinaciæ.....	Turkey, Cock.
5. Gallatoriæ.....	Crane, Woodcock.
6. Palmipedes.....	Goose, Northern Diver, Swan.

CLASS III.—REPTILIA.

1. Chelonia.....	Turtle, Tortoise.
2. Sauria.....	Lizard.
3. Ophidia.....	Viper.
4. Batrachia.....	Toad, Frog, Chameleon.

CLASS IV.—PISCES.

1. Chondropterygii.....	Ray.
2. Branchiostegii.....	Sturgeon.
3. Apodes.....	Eel.
4. Jugulares.....	Cod, Whiting.
5. Thoracici.....	Perch.
6. Abdominales.....	Salmon, Pike.

MOLLUSCA.

1. Cephalopoda.....	Cuttlefish.
2. Pteropoda.....	Clio borealis, not in the Museum.
3. Gasteropoda.....	Snail.
4. Acephala.....	Oyster.
5. Brachiopoda.....	Lingula, not in the Museum.
6. Cirrhopoda.....	Lepas

ARTICULATA.

Order.	Examples.
1. Annelides.....	Leech, Sea-mouse.
2. Crustacea.....	Crab, Lobster.
3. Aranea.....	Scorpion.
4. Insectæ	Butterfly, Beetle, Grasshopper.

RADIATA.

1. Echinodermata.....	Star-fish, Sea-urchin.
2. Entozoa, Intestinal.....	Ascarides.
	without intestines...Tape-worm, hydatid.
3. Acalepha.....	Medusa.
4. Polypi.....	Coral, Madrepore.
5. Infusoria.....	Wheel-Animalcule.



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CATALOGUE,

&c.

ORGANS OF LOCOMOTION.

- A. 1. Pure phosphate of lime from human bone.
- A. 2. Impure bone earth.
- A. 3. A human bone deprived of its animal matter by calcination.
- A. 4. The bone of a bird calcined.
- A. 7. A human scapula deprived of its earthy matter by acid, and preserved in oil of turpentine.
- A. 8. A human clavicle similarly treated.
- A. 9. A human rib deprived of its earthy matter, and twisted on itself.
- A. 10. A human humerus similarly treated, and tied in a knot.
- A. 15. The cancelli of human bone displayed by a longitudinal section.
- A. 16. The cancelli of a human bone displayed by a transverse section.
- A. 17. A section of a human femur.
- A. 18. A section of a vertebra.
- A. 19. A section of an os calcis.
- A. 20. A section of a human clavicle.
- A. 21. The parietal bone of a human foetus to show its radiating structure.
- A. 22. A longitudinal section of an ulna.
- A. 23. A longitudinal section of a humerus.

A. 24. The head of a rabbit: the bones of which are tinged red, by feeding the animal on madder.

A. 28. The femur of a fœtus with the epiphysis injected.

A. 29. A similar preparation.

A. 30. The femur of a child, the epiphysis of which are connected to the shaft by cartilage.

A. 31. A full sized femur, the epiphysis not yet united by bone.

A. 32. The hand of a fœtus, to show the terminal cartilages of the bones.

A. 43. A transverse section of a portion of a femur, to show its microscopic structure. The Haversian canals, and the concentric lamellæ surrounding them, are well seen.

A. 44. A longitudinal section from the same femur, showing the Haversian canals cut longitudinally and the ossific corpuscles, with the ramifying lines issuing from them.

A. 45. A similar preparation.

A. 46. A transverse section of the compact tissue of the head of the femur, to show its microscopic structure.

A. 59. The sucker of a sucking fish, (*Echeneis remora*,) it is an oval-shaped organ surrounded by a cartilaginous rim, which encloses a double series of cartilaginous plates. These are 18 in number, run transversely, and are serrated along the edges. They are capable of being raised from their present flat position, by which means, vacua are formed between them, the animal can thus adhere firmly to the surface of other fish, and progress through the water without any effort.

A. 60. A section of the spine of an angel shark (*squalus squatina*) to show the cups between the bodies of the vertebræ.

A. 61. A dried specimen of the same.

A. 63. A section of the femur of a seal. (*Phoca vitulina*.)

A. 66. A section of the femur of a tortoise, to show the absence of a medullary cavity.

A. 69. The humerus of a crane, to show the air cavity in its centre, and the foramen leading into it.

A. 70. The femur of an eagle.

A. 71. The femur of a monkey, showing its large medullary canal.

A. 72. The spine of a gar pike, (*Esox belone*,) to show its green bones.

A. 77. A portion of human bone prepared so as to present a

fibrous appearance ; this is produced by running a sharp instrument lengthways through its structure, when softened by immersion in acid ; it gives an erroneous idea of the structure of bone.

A. 87. A tendo Achillis unraveled, to show the structure of tendon.

B. 1. *Spongia officinalis*.

B. 2. *Spongia palmata*.

B. 4. *Alcyonium digitatum*.

B. 6. *Corallina officinalis*.

B. 7. *Madrepora muricata*.

B. 14. *Asterias rubens*, (starfish.)

B. 16. A perfect sea-urchin, (*echinus esculentus*.)

B. 17. A section of an echinus, to show its structure. In this preparation are exhibited the five double columns of perforated plates for the passage of the suckers, each column containing 160 pieces ; and the five rows of tubercular plates, each row containing 32 plates, and having each, five tubercles for the attachment of the spines.

B. 18. The duck barnacle, (*Lepas anatifera*.)

B. 19. *Lepas balanus*—several specimens.

B. 20. The shell of a snail (*Helix pomatia*) which has been broken and repaired by new growth.

B. 21. *Solen siliqua*, the razor shell.

B. 22. *Solen legumen*, the pease pod.

B. 23. Elastic ligament and hinge of a *Pecten maximus*.

B. 24. Worm shells, (*Serpula spirorbis*.)

B. 26. The Sepium or cuttle bone from the back of the *Sepia officinalis*.

B. 27. A section of Sepium, to show its structure composed of semi-circular laminae, united by perpendicular septa ; it is remarkably brittle.

B. 28. The horny lamina, called the pen, from the back of the *sepia loligo*, (the common calmar) taken from a kind of sheath, formed for it in the tough skin of the back.

B. 33. Skeleton of an angel shark, (*Squalus squatina*.)

B. 34. Skeleton of a salmon, (*Salmo trutta*.)

B. 35. Skeleton of a garpike, (*Esox belone*)

B. 36. Skeleton of a gurnard, (*Trigla lyra*.)

B. 40. Skeleton of a toad, (*Rana bufo*.)

B. 41. Skeleton of a tortoise, (*Testudo græca*.) Prepared by Dr. Jameson.

B. 42. Skeleton of a tortoise, a small species.

B. 43. Skeleton of a chameleon, (*Lacerta chameleon*.)

B. 51. Skeleton of a cock, (*Phasianus gallus*.)

B. 52. Skeleton of a cock, Bantam variety.

B. 53. Skeleton of a gull, (*Larus cyano-rhyncus*.)

B. 54. Skeleton of a gull, (*Larus canus*.)

B. 55. Skeleton of a swallow, (*Hirundo urbica*.)

B. 56. Skeleton of a blackbird, (*Turdus merula*.)

B. 57. Skeleton of a hawk, (*Falco nisus*.)

B. 58. A similar preparation.

B. 59. Skeleton of an owl, (*Strix otus*.)

B. 60. Skeleton of an owl, (*Strix otus*.)

B. 61. Skeleton of a cockatoo.

B. 62. Skeleton of a crane, (*Ardea grus*.)

B. 63. The Pelvis and sternum of an emeu, (*Struthio Casuarius*.)

B. 69. A series of the breast-bones of birds.

B. 70. The skeleton of a rabbit, (*Lepus cuniculus*.)

B. 71. The skeleton of a mole, (*Talpa europea*.)

B. 72. Skeleton of a badger, (*Meles vulgaris*.)

B. 73. Skeleton of a bat, (*Vespertilio murinus*.)

B. 74. A dried and stuffed skin of a bat.

B. 75. A dried and stuffed skin of a horseshoe bat, (*Pteropus vulgaris*.)

B. 76. Skeleton of a cat, (*Felis catus*.)

B. 77. Skeleton of a cat, (Tailless variety.)

B. 78. Pelvis of a seal.

B. 79. Superior and inferior extremities of a seal, (*Phoca vitulina*.)

B. 80. Skeleton of a porpoise, (*Delphinus phocæna*.)

B. 81. The femur of a fossil elk.

B. 82. Skeleton of a camel, (*Camelus bactrianus*.) Presented by R. Moore, Esq.

B. 83. Skeleton of peccary, (*Dicotyles torquatus*.)

B. 84. Skeleton of a hedgehog, (*Erinaceus europeus*.)

B. 85. Spine and Pelvis of a monkey.

B. 86. The skeleton of an otter, (*Lutra vulgaris*.)

B. 87. The skeleton of a monkey.

- B. 88. The skeleton of a prehensile-tailed monkey, (*Sai capacina*)
- B. 93. Skeleton of human foetus at the 4th month.
- B. 94. Skeleton of human foetus at the 5th month.
- B. 95. Skeleton of human foetus at the 6th month.
- B. 96. Skeleton of human foetus at the 9th month.
- B. 97. Separated bones of foetus at the 9th month.
- B. 98. Spine of foetus.
- B. 101. Adult human skeleton.

C. 1. The head of a sturgeon, (*Ascipenser sturio*.)

C. 2. A similar specimen.

C. 5. The head of a pike, (*Esox lucius*.)

C. 6. The head of a garpike, (*Esox belone*.)

C. 9. The head of a tortoise, (*Testudo greca*.)

C. 10. A similar specimen.

C. 11. The head of a lizard, (*Lacerta agilis*.)

C. 16. The head of a crane, (*Ardea grus*.)

C. 17. The head of an owl, (*Strix otus*.)

C. 18. The head of a falcon, (*Falco nisus*.)

C. 19. The head of a woodcock, (*Scolopax rusticola*.)

C. 20. The head of a toucan, (*Tucanus ramphastus*.)

C. 21. Head of an albatros—(*Diomedea exulans*.) donor, Dr Nixon.

C. 22. Head of a gull, (*Larus canus*.)

C. 23. Head of a cock, (*Phasianus gallus*.)

C. 24. Head of a crane, (*Ardea grus*.)

C. 25. Head of a cormorant, (*Phalacrocorax carbo*.)

C. 26. Head of an ostrich, (*Struthio camelus*.)

C. 27. Head of a cockatoo.

C. 28. Head of a swan, (*Anas olor*.)

C. 35. A section of the head of a bird : to show its interior.

C. 40. Head of a sheep, (*Ovis aries*.)

C. 41. Head of a goat, (*Capra hircus*.)

C. 42. Head of a horse, (*Equus caballus*.)

C. 43. The interior of horse's head exposed.

C. 44. Head of a rat, (*Mus rattus*.)

C. 45. Head of a rabbit, (*Lepus cuniculus*.)

C. 46. Head of a guinea pig, (*Cavia cobaia*.)

C. 46a. Head of capybara, (*Cavia capybara*.)

- C. 47. Head of a seal, (*Phoca vitulina*.)
- C. 48. Head of a bull-dog, (*Canis familiaris*.)
- C. 49. Head of a hound—several.
- C. 50. Head of a fox, (*Canis vulpes*.)
- C. 51. Head of an otter, (*Lutra vulgaris*.)
- C. 52. Head of the same.
- C. 53. Head of a mole, (*Talpa europea*.)
- C. 54. Head of a hedgehog, (*Erinaceus europæus*.)
- C. 55. Head of an agouti, (*Chloromys agoutis*.)
- C. 56. Head of a bat, (*Vespertilio murinus*.)
- C. 57. Head of a shrew, (*Sorex araneus*.)
- C. 58. Head of a fox, (*Canis vulpes*.)
- C. 59. Head of a monkey.
- C. 60. Head of a ring-tailed monkey laid open to show the interior.
- C. 61. Separated bones of a cat's head.
- C. 62. The cranium of a cat laid open to show the bony tentorium.
- C. 63. Head of a ring-tailed monkey.
- C. 75. Head of a human foetus at the 5th month.
- C. 76. Head of a human foetus at the 9th month.
- C. 77. Head of a child about 5 years' old.
- C. 78. Head of a child laid open to show the membranes dried.
- C. 79. A child's cranium laid open to show the sinuses of the dura mater.
- C. 80. Adult crania of human subject—several specimens.
- C. 81. Cranium of an edentulous subject, the alveoli nearly absorbed.
- C. 82. Cranium of an edentulous subject, the alveoli absorbed.
- C. 83. Human cranium painted.
- C. 84. Human cranium painted on the inside.
- C. 85. A similar preparation.
- C. 86. A cranium prepared to show its venous canals.
- C. 87. Cranium presenting large depressions for the glandulæ pacci.
- C. 88. Cranium nearly diaphanous from the absence of diploe.
- C. 89. Cranium remarkably thick and solid.
- C. 90. A human cranium with very large ossa-triangularia.
- C. 93. The bones of the foetal head, at the 4th month, separated.
- C. 94. The bones of the foetal head at the 6th month.
- C. 95. The bones of the foetal head, at the 9th month, separated.

- C. 98. A vertebral column painted.
- C. 99. An adult female pelvis.
- C. 100. An adult male pelvis—several.
- C. 101. The pelvis of a child three years' old.
- C. 102. The pelvis of a child ten years' old.

PATHOLOGY OF BONE.

D. 1. A knee-joint with an enlarged ligamentum mucosum.

D. 2. Osseous granulations on the head of the fibula.

D. 3. Caries of the astragalus and os-calcis; the cartilages and interosseous ligaments are almost entirely destroyed, and the bone to a considerable extent is carious. A large sinus leads to the outside of the ankle, where the skin shows the remains of several cicatrices. The bone beyond the carious part is perfectly healthy.

D. 4. Caries of the head and fore part of the tibia, a dried preparation.

D. 5. Ulceration of the cartilages on the lower surface of the femur and posterior surface of the patella. The bone is also slightly eroded on the surface, but healthy in the interior. Four sinuses lead to the surface of the knee.

D. 6. Caries of the head of the radius and upper part of the ulna; the head of the radius is dislocated forward and inwards. The elbow-joint was much enlarged and in a state of semipronation, flexion and extension were imperfect, and a distinct crepitus was felt on moving the fore-arm. A sinus opened over the head of the radius and discharged bloody serum.

D. 8. The humerus of a bird, carious at its upper extremity.

D. 16. Pott's curvature of the spine. The bodies and intervertebral substance of the dorsal vertebræ from the 3rd to the 12th, are completely removed. The curve is angular very acute, and is greatest opposite the 7th dorsal vertebra. The spinous processes of the 8th and 9th turn perpendicularly downwards, whilst those of the vertebræ above are only slightly oblique. The ribs below the 3rd are nearly approximated, and run with a gentle curve downwards and forwards, so that the false ones approach within one inch and a half of the crest of the ilium.

D. 20. The bodies of the 3rd, 4th and 5th dorsal vertebræ eroded by absorption, caused by pressure of an aneurism of the aorta, (see H. 32.)

D. 21. Absorption of the bodies of the 11th and 12th dorsal, and of the 1st and 2nd lumbar vertebræ. The first lumbar is nearly excavated to its centre on the left side, and its transverse process is considerably eroded, the bodies of all the others are nearly equally eroded on the two sides; caused by pressure of an aneurism of the aorta, (see H. 35.)

D. 25. Lateral curvature of the spine; the curve is directed to the right side and approaches nearly to a right angle, caused by absorption of the left side of the body of the 6th dorsal vertebra, and a great part of the bodies of the 5th and 7th on the same side. The other vertebræ are but slightly affected. The spinous processes are nearly horizontal above, but the 5th, 6th and 7th descend perpendicularly, and are nearly in contact. The laminae of the vertebræ are also altered, being three-fourths of an inch broad on the right, but scarcely one-fourth of an inch broad on the left side. The ribs of the right side approach to within half-an-inch of the curve of the spine; their angles are flattened, the upper five on this side are about half-an-inch distant, whilst the next five descend so obliquely as to touch each other. The ribs of the left side have their angles rounded and are altered in shape, they are somewhat triangular, the sharp angle being directed inwards towards the chest.—Donor, Dr. Corrigan.

D. 26. A portion of a spine showing the entire of one curve and a portion of a second. The first is convex to the right, and arises from absorption of the greater part of the left side of the body of the 3rd lumbar vertebra; the intervertebral cartilage is also thin on that side and thickened on the opposite, and the 3rd vertebra itself appears to be driven over to the right so as to project considerably on that side. The 2nd, 3rd and 4th lumbar vertebræ are connected to each other by bony exostoses. The second curve is formed by the three last lumbar vertebræ, the bodies of which are compressed on the right side, and connected to each other and to the last rib by an exostosis. The spinous processes are turned towards the concavity of the curve.—Donor, Dr. Neligan.

D. 27. Lateral curvature of the spine. There are two curves; the lower one, formed by the 6th, 7th, 8th and 9th dorsal vertebræ, is

convex to the right side ; the upper, formed by the 2nd, 3rd and 4th dorsal, is convex to the left side. The spinous processes are also irregular ; the 4th, 5th and 6th are turned to the right side ; the 7th is abruptly twisted to the left. The ribs are slightly flattened and depressed on the right side above, the lower part of the sternum is turned to the right and depressed towards the thorax. The curves in this case are not considerable, but are reversed, the upper dorsal curve being directed to the left side.

D. 31. Curvature of the spine and deposit of a plate of bone on the interior of the ribs of the left side, caused by empyema. The spine is convex to the right side, the greatest curve being opposite the 4th and 5th dorsal vertebræ, but it affects more or less the seven superior dorsal vertebræ. The ribs are widely separated on the right side, on the left the superior three are in contact by their edges, and the next four overlap each other. The latter are completely altered in shape, their flat surfaces look upward and downward, whilst one sharp edge looks inwards, and the other more rounded and about one-eighth of an inch thick, is directed outwards. The interior of the chest on the left side is lined from the first to the tenth rib by a bony plate, which presents an irregular surface by which it was connected to a mass of lymph which united it to the surface of the lung. The lung was compressed between the bony plate and the pericardium, it presented a healthy appearance, but was not more than one inch thick throughout.—(Prepared by Mr. Butcher.)

D. 35. Lateral curvature of the spine of a fowl. There are two curves, one to the right at the lower part of the dorsal region, the other to the left at the upper part of the lumbar region ; the curves are sharp, and a straight bony crest unites the spinous processes and extends along the two curves. The fowl was very healthy and well fed.

D. 38. Rachitis of a human femur. The shaft of the bone is convex forwards and outwards, the neck stands horizontally, so that its head is below the level of the trochanter major.

D. 39. Rachitis of the femur of a female. The shaft is like the last, the neck presents its natural obliquity, but is thrown behind its normal situation.

D. 40. A section of a femur affected with rachitis : its compact tissue is half an inch thick on the concave side of the curve, and the medullary cavity is nearly filled with cancellated structure at the part.

D. 41. A similar specimen.

D. 42. Rachitis of the tibia and fibula of a fowl; a section of the tibia has been made to show the interior.

D. 43. Rachitis of tibia and fibula. These bones are curved forwards and altered in shape, being flattened from side to side and elongated from before backwards. The tibia is little more than half an inch thick at its centre.

D. 47. A femur some years after amputation—the extremity of the medullary canal is covered by an osseous cap, the bone is diminished in size and the linea aspera nearly removed.

D. 48. The stump of an arm shewing the extremities of the nerves presenting a bulbous appearance.

D. 49. The femur after amputation presenting a partial exfoliation. Its surface is rough by exostosis at its lower part, but no attempt has been made to close the canal.

D. 51. Three inches of the upper extremity of the tibia and fibula some time after amputation. The medullary canal is closed with a very thin osseous lamina.

D. 59. True ankylosis of the two last curvical vertebræ. They are united chiefly by their bodies and oblique processes.

D. 60. True ankylosis of the second and third cervical vertebræ.

D. 61. A similar disease—the laminæ, articular processes and bodies of the vertebræ, are all united by bony plates.

D. 62. True ankylosis of all the dorsal and of the two first lumbar vertebræ with each other and with the heads of the ribs. A smooth sheet of bone covers the intervertebral spaces from the 8th dorsal to the 2nd lumbar vertebra, both anteriorly and laterally, but the vertebræ above are only connected on the sides. The ribs are united to the vertebræ, both by their heads and transverse processes; but in all cases it appears to be by the ossification of the ligaments: the spine is not deformed, but no motion could have taken place between the bones.

D. 63. True but partial ankylosis of the three first lumbar vertebræ.

D. 64. True ankylosis of the ulna and humerus. The fore-arm is bent to a right angle on the humerus, the fossa on the back of the humerus is filled with an irregular bony deposit.

D. 70. An excellent specimen of oblique pelvis. The ilium and sacrum are so completely consolidated, that no line of demarcation

whatever exists on the inner, and only a slight ridge on the outer surface. The symphysis pubis corresponds to within half an inch of the right sacro iliac synchondrosis; the sacrum thus lies completely to the left side of the mesial line. The obliquity depends on narrowing of the left side of the sacrum and ilium; the left side of the sacrum being only $1\frac{1}{4}$ inches, the right side is 2 inches wide. The upper sacral foramina of the left side are also narrowed transversely, to one half their proper diameter. The ilium is contracted from before backwards, being only $5\frac{1}{2}$ inches from the anterior to the posterior spines of the ilium: at the same time it appears to be increased in height, being about $4\frac{3}{4}$ inches from the highest point of the crest to the great sacro-sciatic notch, which is itself narrower than natural. The pubis and ischium are normal.

D. 71. Anchylosis of the sacro-iliac synchondrosis of the left side without any other deformity.

D. 74. Anchylosis of the ilio sacral synchondrosis with the last lumbar vertebra, caused by a layer of bone which unites without injuring or destroying the articular surfaces. There is another exostosis on the pelvis, and another on the femur.

D. 75. False anchylosis of the knee-joint. The bones are united, especially the femur and patella, by a firm fibrous membrane. The joint is flexed to nearly a right angle, and but slightly moveable, and the tibia is carried behind its natural position on the femur. A large abscess occupied the popliteal region.

D. 76. True and perfect anchylosis of the knee-joint. The tibia and femur are bent to nearly a right angle, and the patella is so completely united to the femur, that the cancelli of the three bones are continuous, without any line of demarcation whatever. The tibia and femur are also united perfectly by the complete ossification of the semilunar cartilages. The tibia projects outwards, considerably, beyond the level of the femur. Taken from a man aged 40; it had been ankylosed for twenty years.

D. 77. True anchylosis of the knee-joint. Externally, the tibia and femur are so perfectly united, that nothing marks their union, except a projecting ridge of bone, and a slight groove only separates the patella from the femur. A section has been made in the mesial line; this shows that the cancellated tissue of the three bones are perfectly continuous throughout, without even a line to mark their former separation. The tibia is at its upper part *more* filled with

cancellated tissue than natural. The fibula holds its natural position, and is not engaged in the disease, but presents some exostoses on its surface.

D. 80. Union of the tibia and fibula by extensive exostosis. The interosseous ligament is converted into bone one quarter of an inch thick for the inferior half of its extent. The anterior and posterior tibio-fibular ligaments of the ankle-joint are completely ossified; but the cartilage and synovial membrane were healthy. The fibula is covered with irregular exostosis, and the tibia slightly affected in a similar manner. The limb was removed by Dr. Woodroffe for an extensive ulcer of the leg, which had existed for thirty years. The periosteum and tissues covering the bone were converted into a mass of tissue, nearly as hard as cartilage—donor, Dr. Woodroffe.

D. 81. True ankylosis of the tibia and fibula. The interosseous ligament, the anterior and posterior tibio fibular ligaments are ossified, and the entire surface of both bones covered with irregular exostoses.

D. 82. Exostosis of the tibia. The surface of the bone is covered with new bony deposit, so as to render the compact tissue in many places more than half-an-inch thick. In one part the new bone appears as if scooped out, leaving the surface of the bone nearly smooth: this was the seat of a large ulcer.

D. 83. A node in front of the tibia.

D. 84. Exostosis of the femur principally affecting its posterior surface, in the region of the linea aspera: it is arranged in a cellular layer, and it is very rough on the surface.

D. 85. A fusiform enlargement of the upper part of the tibia. An oblique section shows the immense thickness and density of the compact tissue. The medullary cavity is filled with cancellated tissue.

D. 86. A tibia presenting two nodes on its posterior aspect.

D. 87. A node of the tibia: it has flattened and smoothed the spine of the tibia.

D. 88. A tibia covered with exostosis.

D. 89. A tibia affected with exostosis at its lower part: it presents a very peculiar reticular character.

D. 90. A portion of an adult femur from the inner condyle of which a process of bone stands out, which arched over the course of the femoral artery.

D. 91. A section of a node of the tibia: to show its density.

D. 92. Exostosis of the fibula: it extends over the principal part of the shaft of the bone.

D. 93. Two small nodes of the lower extremity of the fibula.

D. 94. A section of a fibula: rough and very irregular on the surface from exostosis.

D. 95. Exostosis of the ribs. From several of the ribs bony processes stand out; two of these arising from neighbouring ribs approach, so as to touch each other.

D. 97. A small exostosis of upper part of the humerus.

D. 98. An exostosis of the centre of the humerus, about the insertion of the deltoid.

D. 99. A fusiform enlargement of the lower extremity of the ulna.

D. 100. Abscess of the femur. The bone is considerably enlarged in the middle, being $2\frac{1}{2}$ inches in diameter where the medullary canal is completely filled with cancellated structure; but at its lower extremity the bone is excavated by a cavity of considerable size, which opens on the inner side by an oval aperture with smooth edges, it contained pus in the recent state: the upper and lower extremities of the bone are nearly healthy, and the surface is rough from exostosis.

D. 101. A similar disease of the lower third of the femur. The bone is hollowed by an irregular cavity, which communicates with the surface by a foramen of a circular shape with smooth edges, and of the size of a crow quill; the entire of the lower third of the bone is covered by exostoses, the upper two-thirds are healthy.

D. 102. An abscess in a cow's rib. The cavity is about three inches long, with smooth walls, and in the recent state contained pus.

D. 103. A cavity in the centre of the femur of a fowl: it is smooth on the interior, and has very thick and dense walls. The air cells of the bone above and below are completely filled up.

D. 105. A skull cap which is covered with depressions on its inner surface: they have irregular edges, and two of them perforated the bone. The inner table is much more affected than the exterior; they do not lie in the line of the sinuses, and were caused by cancer of the dura mater.

D. 106. A skull cap—covered with depressions on its inner surface, caused by enlarged glandulæ pachioni; they are in the line of the sutures, especially the sagittal, and present irregular edges, but

their surfaces are still covered by compact tissue. One of the largest is in the parietal bone, and communicates with the deep sulcus for the middle meningeal artery;—the outer surface of the bone, corresponding to this depression, is slightly elevated on the surface, and covered by a shell of bone not thicker than paper.

D. 107. A similar preparation, but the depressions are not so deep. The two largest communicate with the deep groove for the meningeal artery.

D. 115. The cranium of a syphilitic subject. The exterior is irregular from numerous depressions of various shapes all covered with compact tissue. There are three perforations; one is a small cleft in the line of the sagittal suture, another is in the parietal, and the third, a triangular opening, is in the squamous portion of the parietal bone; the edges of this opening are depressed and smooth, and the bone around it is depressed and diaphanous.—Donor, Dr. Jephson.

D. 116. A portion of a cranium remarkably thick and heavy, it is more than half-an-inch thick, and is entirely composed of compact tissue, the inner surface is rough.—Taken from a lunatic.

D. 117. The skeleton of a face, the palate plate of the palate and superior maxillary bones, and a portion of the vomer are deficient. In the recent state, the uvula was cleft, but the soft palate was normal.

D. 130. A stellated fracture of the cranium united by bone. It is situated at the lower and posterior angle of the parietal bone, four of the stellæ terminate at sutures—the fracture is scarcely visible on the inner surface of the bone.

D. 131. A stellated fracture of the os-frontis perfectly united by bone. The stellæ commence on the right side of the bone, one of them crosses over so as to terminate at the coronal suture on the left side, thus traversing the entire bone to end in a suture, another stella ends at the coronal suture on the left side.—Donor, Dr. Nixon.

D. 132. A perforation in the cranium two inches square, filled by a dense membrane derived from the dura-mater and periosteum; it adheres firmly round the edges of the opening, is smooth on the interior but rough on the exterior. The edge of the bone is thick in some places and thin at others. The bones had been removed by Mr. Read in Mercer's Hospital on account of a comminuted fracture, after which the patient lived for many years.

D. 139. Fracture and luxation of a dorsal vertebra. The body of the 7th dorsal vertebra is broken obliquely downwards and forwards, and the upper part driven backward on the spinal marrow, so as to leave only about six lines between it and the posterior wall of the canal. The articular processes of the same bone are luxated behind those of the 6th vertebra, the spinous process of which is broken off close to its connexion with the laminæ, and was in the recent state connected by ligament. A mass of callus thrown out along the margins of the laminæ of the two vertebræ, shows that an attempt has been made to unite them. A similar mass unites the two ribs to the bodies of the vertebræ, and a third unites the broken body of the 7th and 8th dorsal vertebræ. The patient, aged 27, a labourer, received an injury of the back by the falling of a great quantity of stones. His lower extremities were immediately paralyzed but retained their sensation; he had constipation of bowels and retention of urine. After a short time these symptoms were changed to involuntary discharges of urine and feces; ultimately he suffered from muco-purulent urine, bronchitis and bed sores, but lived for three months.

D. 140. Fracture of the body of the seventh cervical vertebra, and luxation of the sixth: the latter is carried forward to the extent of about six lines; and the body of the seventh pressed backwards on the spinal marrow—the articular processes being separated to the same extent. The patient, a celebrated gymnastic teacher, fell from the top of the gymnasium, and died in three days, under the care of Dr. Hargrave and Dr. Macartney.

D. 141. Fracture of a rib: at its angle united.

D. 142. United fracture of a false rib: a section has been made to show its interior.

D. 145. Fracture of the clavicle, two inches from the acromial end. The inner fragment is half-an-inch above the level of the outer; they are united at an angle salient backward.

D. 146. Fracture of a clavicle at its centre, united without deformity, except a groove on the under surface, and a projection of callus.

D. 147. Fracture of the clavicle at its centre, united without deformity.

D. 150. Fracture of the humerus of a fowl, united at a right angle by a large mass of callus.

D. 151. Un-united fracture of the humerus, partly within the capsular ligament. The fracture is oblique downwards and inwards : the capsular ligament retains its connexion to the neck of the humerus on the outer side ; but on the inner it opens into a large sac of a fibrous structure, formed between the ends of the bone : this communicates freely with the synovial membrane, and on the inner side contains spiculæ of bone. The broken surfaces are covered by fibrous tissue. The tendon of the biceps was broken within the capsular ligament, and is now attached to its fore part. The arm was an inch and a half shorter than the opposite one, and freely moveable in every direction. An un-united fracture of the neck of the femur was found in the same patient on the same side. (See D. 165.) Taken from a woman aged 55.

D. 152. Fracture of the radius half-an-inch above the wrist-joint. The fracture was nearly transverse. The lower fragment is carried backwards and outwards, and thus is formed an angle salient towards the ulna ; but not to such a degree as to obliterate the interosseous space. The head of the ulna is on a plane below its corresponding articular cavity. A section of the radius has been made, and shows that the posterior margin of the upper fragment is impacted into the cancelli of the lower.

D. 160. Fracture of the radius extending obliquely from two inches and a half above the wrist on the outer side, to one inch from the wrist on the inner side ; it is united at a considerable angle salient forward and inward. The upper fragment overlaps the ulna in front, whilst the lower extremity is thrown considerably backwards ; the interosseous space is not more than one quarter of an inch wide in any part of its extent, and for the lower three inches is completely obliterated by the approximation of the bones. The head of the ulna is thrown forwards.—Donor, Dr. Stoker.

D. 161. Fracture of the humerus of a swan un-united. The two extremities of the fracture are pointed, and completely covered with a cap of bone ; they overlapped each other for more than an inch ; irregular masses of callus are thrown out on the lower fragment.

D. 162. Fracture of the humerus of a domestic fowl united at an angle ; a pointed spicula projects inwards from the lower fragment.—Donor, Dr. Neligan.

D. 163. Fracture of the tibia and fibula of a tortoise. The limb is much shortened, the tibia united by a large mass of callus, but the fibula is un-united, and the fragments overlap each other.

D. 164. Fracture of the neck of the femur ; the head is separated exactly at the point of union with its neck, a portion of the neck has been absorbed, but no attempt at union has taken place.

D. 165. Fracture of the neck of the femur from an old woman : it is situated within the capsular ligament. The limb was rotated *inwards* and shortened, but could be rotated outwards with facility. No crepitus was perceived. The capsular ligament is much thickened, especially at its anterior part. The neck of the bone is absorbed from its point of connexion with the shaft, the fragments being united merely by bands of lymph. The opposite surfaces of the fracture are smooth, but present no appearance of ossific deposit. The rotators outwards are all attached to the bone, and the anterior edges of the gluteus medius and minimus are much thickened: taken from the same subject as D. 151.

D. 166. Fracture of the neck of the femur extending obliquely from above, downwards, backwards, and inwards ; it passes through the trochanter and anterior intertrochanteric line to below the trochanter minor ; there is no attempt at union of these two fragments, but the posterior part of the trochanter major which was separated from its attachment to the neck, was united by a band of ligamentous structure to the back part of the neck of the bone, being carried into that position by the attachment of the small rotators outwards ; a large irregular mass of callus is thrown out from the shaft which assisted in supporting the neck of the bone.

D. 167. Fracture of the neck of the femur, extending obliquely through the trochanter major, along the anterior and posterior intertrochanteric lines to below the trochanter minor ; the anterior half of the trochanter major was left attached to the shaft of the bone, whilst the posterior with the rotators outwards, as well as the trochanter minor, were broken off. The three fragments are completely united, but with considerable deformity. The neck is united to the shaft at a right angle, so that the head is half an inch below the level of the trochanter major ; the shaft is so much rotated outwards, that the linea aspera looks directly outwards; the trochanter minor is united irregularly to the inner and anterior part of the bone ; the posterior part of the trochanter major is united to the anterior and to the back of the neck of the femur by an irregular mass of callus, it is also connected to the trochanter minor by a ridge of callus.

D. 168. Fracture of the neck of the femur at its junction with

the shaft, perfectly re-united and with very little deformity. The head of the bone is rough, and from its margin a small exostosis overlaps the upper part of its neck, and thus proves the existence of rheumatic arthritis; a large ridge of callus, corresponding to the posterior intertrochanteric line, marks the seat of the fracture; the trochanter minor appears to have been broken off and incorporated with this ridge: a section has been made, which shows that the compact tissue is replaced by cancellated structure at the seat of fracture, but the remainder of the neck is perfectly normal.

D. 170. Impacted fracture of the neck of the femur through the intertrochanteric line: it extends through the anterior and upper part of the trochanter major, to below the trochanter minor; the trochanter major overlaps and adheres to the back part of the neck of the bone: the neck is depressed, so that its lower margin approaches within the eighth of an inch of the trochanter minor, and its upper margin stands about six lines below the level of the trochanter major; the lower part of the neck is driven outward and impacted into the shaft. The patient was aged about 50; the limb was $1\frac{1}{4}$ inches shortened, and very much rotated outwards.

D. 171. Fracture of the shaft of the femur; six weeks after the accident no union has taken place. The periosteum is thickened and injected, and the margins of the bone are thinned and softened; the medullary cavity is filled with lymph for about half an inch, the remainder of the cavity is filled with fatty matter and lymph mixed.

D. 172. Fracture of the femur of a crane, united by a large mass of callus. The upper fragment is connected to the upper surface of the lower at a right angle, midway between the knee joint and the fractured portion, so that the limb is shortened one-third; the lower fragment protrudes one inch behind their point of union.

D. 175. Fracture of the tibia and fibula about four inches above the maleolus, united by bone; the internal maleolus is also broken off, but remains un-united by bone.

D. 177. Separation of the tibia from its lower epiphysis: a small part of the shaft remains attached to the epiphysis on the outer part, which is roughed and spiculated, the rest is covered by fibro-cartilage. The fibula is fractured obliquely about two inches and a half above its extremity, and one inch and a half above the fracture of the tibia.

D. 178. Fracture of the tibia and fibula united at an angle near the centre. The fracture runs obliquely downwards and backwards.

The tibia is united to the fibula by a transverse mass of callus, which crosses the interosseous space like an arch, where the bones are more than half-an-inch distant from each other. The medullary canal is filled with cancellated structure, and an oblique line of compact tissue shows the original seat of the fracture.

D. 179. Fracture of the tibia and fibula of a cow. The tibia is broken in the centre, and united at an angle by a large mass of callus. The fibula is broken very near its head, five inches above the fracture of the tibia on its inner surface; the tibia is carious to a considerable extent.

D. 190. The sternum of a bird perforated by two apertures at its posterior part: one is triangular in shape, probably produced by shot: no attempt at closing the opening has taken place.

D. 198. Luxation of the first phalanx of the thumb on the dorsum of the metacarpal bone. The phalanx is carried upwards for three quarters of an inch; and the tendon of the flexor longus pollicis runs on the inner side of the head of the metacarpal bone.

D. 200. Chronic arthritis of the lower dorsal and lumbar vertebræ and of the sacrum. The margins of the articular surfaces of the vertebræ are expanded and united to each other by long bony exostoses; and the sacrum is connected to the vertebræ in a similar manner. The bones were soft and spongy, and easily cut with a knife in the recent state. The intervertebral fibro-cartilage was not materially injured. Taken from an old woman.

D. 201. Four lumbar vertebræ, presenting similar disease in a slighter degree, and having exostoses from the edges of their oblique processes and spines which are enlarged.

D. 210. The upper portion of a sternum united to the first rib by a perfect ossification of its cartilage.

D. 211. The upper portion of the sternum presenting an irregular mass of exostosis at its point of union with the first rib: probably chronic rheumatic arthritis.

D. 212. Chronic arthritis of the head of the humerus: irregular masses of exostosis surround the head of the bone, and envelope its neck in some places. The bicipital groove is obliterated above. The tendon of the biceps was united to the margin of the groove.

D. 212*a*. Chronic rheumatic arthritis of the shoulder-joint. The upper part of the glenoid cavity is enlarged, deprived of cartilage, and covered with ivory deposit. The under surface of the acromion

is coated with exostosis, and ten bony masses are deposited around it; these are smoothed by friction against the head of the humerus, and lodged in the capsular ligament. The acromio-clavicular articulation is affected by a similar disease: the extremity of the clavicle is enlarged, and the inter articular cartilage converted into bone. The head of the humerus is considerably enlarged by a bony rim attached round its margin, which overlaps the neck of the bone, and is united with the greater and lesser tubercles. The cotyloid ligament is absorbed at its upper part; as is also that portion of the long tendon of the biceps, which passed through the joint: the remainder of it is connected with the inner margin of the bicipital groove. The sternal extremity of the clavicle has on its under surface a mass of exostosis, by which it rested on the first rib. Taken from a woman aged about 60.

D. 212*b*. A similar preparation taken from the same woman; but the disease has not gone so far: part of the capsular ligament is left in situ.

D. 213. A similar disease of the head of the humerus, but not so well marked.

D. 214. Chronic rheumatic arthritis of the wrist-joint. The carpus is thrown forward and inward, so as to resemble a luxation forward of the carpus. The lunar bone is perfectly ankylosed to the radius. From the margins of the radius, ulna, scaphoid, and lunar bones, considerable bony processes stand out. The head of the ulna lies to the back of the lunar bone, and thus is thrown completely behind its natural position.

D. 220. Chronic arthritis of the wrist-joint. The extremities of the radius and ulna are considerably enlarged by exostosis, especially on their anterior margins. The cartilages of incrustation of the radius are replaced by ivory exostosis, and the lunar and cuneiform bones are covered by a similar deposit, but otherwise unaltered. The carpus is but slightly thrown forward.

D. 221. An ulna presenting ivory deposit on its lower extremity.

D. 222. Chronic arthritis of the trapezium and metacarpal bone of the thumb. The articular surfaces are covered with ivory deposit, and their margins by irregular exostosis.

D. 225. Chronic arthritis of the acromio-clavicular articulation; the articular ends of the bones are expanded, and the cartilages partly removed.

D. 226. Chronic arthritis of the acromial end of the clavicle; it is three quarters of an inch thick, and its surface rough and irregular, with masses of exostosis round its margins.

D. 230. Chronic arthritis of the hip-joint; in the incipient stage the cartilage is absorbed on the upper and anterior part of the head of the femur, which is prolonged on its neck by a smooth exostosis attached to its margin. The acetabulum is deepened on its upper margin by exostosis. The round ligament still held its attachment, but is much attenuated.

D. 235. Chronic rheumatic arthritis of the hip-joint. The acetabulum is deepened by a deposit of bone round its margin, and the conversion of the cotyloid and transverse ligaments into bone; thus instead of the notch there is an irregular opening situated at the bottom of the acetabulum, beneath which was lodged in a cavity the fatty body, and a very few fibres of the round ligament. The upper part of the cavity is covered by an imperfect ivory deposit. The head of the femur has a deposit of bony matter round its margin, extending over its neck, which is thus apparently shortened, and the entire surface of the anterior part of the neck is covered by a similar deposit. The cartilage was removed from the upper part of the head, and replaced by a layer of imperfect enamel, taken from the same woman as D. 230.

D. 236. The upper part of a femur presenting the effects of chronic arthritis. The head is conical in shape, rough on the surface, and prolonged over the neck by means of an exostosis, which is attached all round its margin; the depression for the round ligament is removed.

D. 237. Chronic arthritis of the hip-joint. The acetabulum is deepened to the extent of nearly an inch by a bony rim attached round its margin, and a bony process taking the direction of the posterior tendon of the rectus femoris is attached above its upper edge. The transverse ligament is replaced by a thick process of bone, but the depression for the round ligament remains perfect. The upper part of the cavity is covered by a layer of ivory exostosis. The head of the bone is flattened above and before, and covered by ivory deposit, perforated by numerous foramina; the depression for the round ligament is altered in shape, and diminished in size; the margin of the head of the bone is prolonged over the neck by bony deposit, especially at its upper and anterior part, corresponding to the deepest part of the acetabulum.

D. 238. Two ossa innominata showing the early stage of chronic rheumatic arthritis; the upper and posterior margin of the acetabulum is lengthened by a deposit of bony matter. No other change has taken place.

D. 240. Chronic rheumatic arthritis of the hip-joint; the upper and anterior part of the neck of the femur is covered by a mass of exostosis, which is perfectly incorporated with its structure; similar deposits are attached all round the margin of the head of the bone, which overlap the neck without being united to it. The head of the femur is flattened so as to resemble that of the humerus; the notch for the insertion of the round ligament being completely removed, and three-fourths of it covered with ivory deposit; at the upper part of the head of the bone is observed a cavity the size of a small nut, and the ivory deposit is perforated by numerous small foramina leading into this cavity. The neck of the femur retains its natural obliquity, and on its back a prominent wart-like exostosis is observed. The acetabulum is shallow and wide, a rim of exostosis is attached to its upper margin; its interior is covered by ivory deposit, but its lower part is healthy, and neither the notch nor fossa for the round ligament are altered.

D. 241. Chronic arthritis of the hip-joint. The head of the femur is pointed and flat above; the depression for the round ligament entirely removed; the surface of the head is pitted, soft, uneven and destitute of either cartilage or ivory deposit. It is apparently much longer than natural, being lengthened by a process of exostosis at least eight lines deep, which overlaps the neck of the bone. The acetabulum is deepened by a bony plate one inch and a half deep above and one inch deep below; the plate above is only united by a strong ligamentous substance, but below it is connected by bone which passes over the notch at the lower part of the acetabulum, so that the vessels entered by a narrow irregular aperture into the bottom of the acetabulum. The plate of bone which separated the acetabulum from the pelvis is so much thinned as to be rendered transparent.

D. 243. Chronic arthritis of the hip-joint. The acetabulum is deepened to the extent of two inches and a quarter at its upper part; this arises, in part, from a lip of bone added to its border, and partly from the cavity being excavated and projected into the pelvis to a slight extent; the bony rim does not extend over the transverse

ligament as in the former specimen; the depression for the round ligament is obliterated. The head of the femur is destroyed, and its place supplied by the neck of the bone modelled to the shape of the acetabulum, so that the distance from the anterior intertrochanteric line to the margin of the new head is only half-an-inch. The new head is nearly conical and pointed, lying on a plane below the level of the trochanter major; its surface is rough, neither covered by cartilage nor ivory deposit. A section of the head shews the cancelli large, especially near the point where a small cavity filled by fatty matter is observed; the head fits into the cavity in a flexed and adducted position, but scarcely admits of any motion.

D. 244. The upper extremity of the femur, showing the effects of chronic arthritis in its early stage. A deposit of bony matter has taken place from the upper margin of the head of the bone which extends over part of the neck, thus diminishing the length of the neck above, but leaving it of its natural size and direction below. The notch for the round ligament remains perfect.

D. 245. Chronic arthritis of the hip-joint. The disease has not gone to any great extent in either the femur or acetabulum; it is remarkable for occurring in a case of united fracture of the neck of the thigh bone.—(D. 168.)

D. 250. Chronic arthritis of the knee-joint. The under surface of the femur, the upper surface of the tibia, and the posterior surface of the patella are covered with villous processes of the serous membrane; the ligamentum mucosum is absorbed, and the alar ligaments and gland of Havers are covered with similar appendages, best marked round the patella. Numerous rounded masses of exostosis surround the articular surface of the femur.

D. 255. Chronic arthritis of the bones of the tarsus. The astragalus is the bone chiefly affected, it is flattened and rendered broader than natural, its outer surface is covered with a large mass of irregular exostosis; the under surface is similarly covered and thus rendered flat, its arch being completely destroyed; the other surfaces are also rough and irregular. The astragalus, navicular and cuboid bones are slightly diseased.

D. 270. A rudiment of a seventh cervical rib, united at an acute angle to the first dorsal rib.

D. 276. An anomalous sternum; it terminates in an ossified zyphoid cartilage which is bifid, and has the two extremities directed forwards towards the skin like two horns.

D. 277. An anomalous sternum; it terminates in a bifid lower extremity, but the apices are directed backwards.

D. 278. An anomalous sternum; its lower part near the zyphoid cartilage, is perforated by a circular aperture with smooth edges.

ORGANS OF DIGESTION.

E. 1. The digestive organs of a star-fish, (*Asterias rubens*.) The mouth is a circular aperture with a slightly thickened margin which leads directly into the stomach. This latter is a membranous bag with very thin walls, from which a short pouch is sent into each of the arms; there is no anus, so that the remains of the food must be ejected by the mouth.

E. 2. The teeth of the sea-urchin, (*Echinus esculentus*.) They are five in number, their points project beyond the mouth and move in the apparatus called Aristotle's lantern.—Prepared by R. Butcher, Esq.

E. 3. The same apparatus with the muscles and ligaments by which it can be protruded or retracted into the animal—(dried.)

E. 5 The gizzard of a *bulla lignaria*—(dried.)

E. 6. The stomach or gizzard of the *bulla lignaria*. It is composed of two strong muscles united by tendons, and receives the œsophagus which forms a crop before entering it.

E. 7. The digestive organs of sea-mouse, (*Aphrodita aculeata*.) The stomach may be likened to a long flat gizzard with powerful transverse muscles and lined with horny cuticle; this leads into an intestine which is straight, narrow, membranous, and gives off a series of cœca on each side.

E. 9. The head of a sturgeon, (*Ascipenser sturio*;) to show its small mouth and cartilaginous jaws destitute of teeth. Two pointed feelers are placed beneath the lower jaw.

E. 10. Teeth of the pike, (*Esox lucius*). The vomer, palatines, tongue, pharyngeals and rays of the branchiæ are bristled with teeth, those along the lower jaw are long and pointed.

E. 11. Teeth of the gar-pike, (*Esox belone*.) The upper and

lower maxillæ, forming the long snout, are covered with small teeth, but there are no others in the mouth.

E. 12. The jaws and teeth of angel-shark, (*Squalus squatina*.) The teeth are sharp, triangular and serrated on the edges, one row only projects beyond the gum, but several are exposed by dissection.

E. 13. The teeth of the ray, (*Raia batis*.) They are flat, smooth, and form a kind of pavement on the jaws; they are covered with enamel, and attached to the surface of the gum.

E. 14. The teeth of the frog-fish, (*Lophius piscatorius*.) They are pointed and curved, and their apices directed backward towards the œsophagus: their bases are connected to the jaw by elastic structure which yields, and thus enables them to escape injury from foreign bodies.

E. 19. Horny teeth or gums of tortoise: the lower presents two ridges with serrated edges, the upper two depressions and three serrated ridges. They are as hard as bone.

E. 23. The beak of a parrot.

E. 24. The bill of an albatross, (*Diomedea exulans*.)

E. 29. The teeth of the porpoise, (*Delphinus phocœna*.)

E. 30. The teeth in the lower jaws of a seal, to show their roots.

E. 31. Canine tooth of a boar, (*Sus scropha*.)

E. 32. Section of a canine tooth of a tiger, (*Felis tigris*.)

E. 33. The teeth of a dog, the roots exposed.

E. 34. The teeth of a cat, the roots exposed.

E. 35. Teeth of a hare, the roots exposed.

E. 36. Teeth of a rabbit, the roots exposed.

E. 37. Teeth of a rat, the roots exposed.

E. 38. Teeth of squirrel, (*Sciurus vulgaris*.)

E. 39. Molar tooth of a capybara, (*Cavia capybara*.)

E. 40. The growing teeth of a calf.

E. 41. Incisor teeth of an ox. Prepared by Mr. Butcher.

E. 42. Teeth of a deer, the roots exposed.

E. 43. The teeth of a sheep, roots exposed.

E. 45. A section of the molar tooth of elephant.

E. 46. A section of the tooth of an hippopotamus.

E. 47. A beautiful section of the molar tooth of a horse.—Donor, Dr. Nixon.

E. 48. The point of the tooth of an hippopotamus, showing the thin coating of enamel on its surface.

E 49. A transverse section of a similar tooth, showing the remains of pulp cavity.

E. 52. Six sections of human teeth.

E. 53. A beautiful set of human teeth.

E. 54. A set of human teeth, the fangs exposed.

E. 55. A set of osseous caps of the teeth of a foetus at the 9th month.

E. 56. Ten sections of human teeth, to shew the different shape of the pulp cavity in the incisor, canine, and molar teeth.

E. 57. Four human teeth deprived of the greater part of their earthy matter by the action of an acid, one of them is carious.

E. 59. The lower jaw of a child at the 4th year, shewing the 20 milk teeth, and the rudiments of the permanent teeth buried in the alveoli.

E. 60. The sacs of the primary teeth of a child injected.

E. 61. Sacs of the primary teeth uninjected.

E. 62. Sacs of two permanent teeth.

E. 63. A human lower jaw, buried for about 200 years, shewing the enamel of the teeth still perfect, whilst the bone of the tooth and of the lower jaw is black and softened.

E. 67. A series of seven lower jaws, to show the alteration in shape from early to adult and edentulous old age; the difference in the angle is well seen in this series.

E. 90. A transverse section of a human molar tooth; the tubuli commencing large in the central pulp cavity, terminate in a number of fine branches towards the circumference; these appear white by reflected light.

E. 91. A transverse section of a human milk tooth.

E. 92. A longitudinal section of a human tooth; in this the tubes of the teeth are also seen, and their orifices in the pulp cavity; towards the root there is also seen an external coating similar to the crusta petrosa of the elephant: the orifices of the tubes in the pulp cavity are seen by reflected light.

E. 95. A section of the ivory of an elephant's tooth; for the microscope, the structure nearly resembles the bone of the human tooth.

E. 96. A similar section of the ivory of the hippopotamus's tooth for the microscope.

E. 97. A section of the elephant's tooth, to shew the microscopic structure of the crusta petrosa; numerous corpuscles, similar to those of bone, but very irregular in shape, and more numerous, are

exhibited; these appear dark by transmitted, but white by reflected light, proving that they are composed of earthy matter: no canals of Havers are present.

E. 105. The tongue of a limpet, (*Patella*); it is much longer than the animal itself, and lies coiled up on the abdominal surface of the animal; it is hard, horny and serrated on the edges.

E. 109. The tongue of a frog; the head has been removed in order to expose the tongue; it is attached by its anterior extremity to the back of the symphysis menti; its posterior part is broad, flat and unattached; the animal has the power of throwing the posterior part of it out of his mouth, and thus is enabled to seize on small insects with rapidity.

E. 110. The tongue of an alligator, (*Lacerta alligator*.) This organ lies flat at the bottom of the mouth, its surface is smooth, being destitute of papillæ, and covered with a firm cuticle.

E. 111. The tongue of a lizard: it is thick and triangular, covered with papillæ, which are soft in front, but behind are horny, with apices directed downwards towards the pharynx.

E. 112. The tongue of a chameleon, (*Lacerta chameleon*.) This organ is thick, round and solid, terminating in a cup which contained a glutinous fluid, and covered with cuticle; its posterior extremity is fitted on a styloid process of the os hyoides, and is composed of erectile tissue, (according to Dr. Houston.) The animal has the power of rapidly projecting this organ from the mouth for several inches, and thereby catching in its cupped extremity small insects.

E. 113. The tongue of a tortoise, (*Testudo greca*.) This is short and triangular, the base behind, covered with a tuft of long papillæ.

E. 116. Tongue of a turkey, (*Meleagris gallopavo*.)

E. 117. Tongue of a parrot; it is thick and fleshy, covered by a layer of deep black coloured horny substance.

E. 118. Tongue of a goose, (*Anser anas*.)

E. 119. Tongue of an emeu, (*Struthio casuarius*.) it is flat, thin, and triangular, with a concave base, directed backwards towards the rudimentary epiglottis; its edges are deeply serrated, and its surface covered with fine openings.

E. 123. Tongue of the porpoise, (*Delphinus phocæna*.) it is thick, fleshy, and covered with a layer of cuticle; in this preparation the cartilaginous prolongation of the epiglottis and arytenoid cartilages is seen projecting into the bag of the pharynx, towards the nares.

E. 124. The tongue of a seal, (*Phoca vitulina*.) It is thick, fleshy, and covered with rounded soft papillæ; its connexion with the larynx and pharynx is seen in this preparation.

E. 125. The tongue of a dog, (*Canis familiaris*.) It is long, thin, and pointed; on its under surface is seen the elastic ligament, (called the worm.)

E. 125. The tongue of a cat, (*Felis catus*.) It is long and flat; its upper surface is covered in front with horny, curved papillæ; the points of which are directed backward, and interspersed with a few soft papillæ, posteriorly it is covered with soft, fleshy tubercles.

E. 127. The tongue of the armadillo: it is remarkably long and narrow, covered with fine papillæ.

E. 128. The tongue of a monkey: it is very similar to the human tongue. Conical papillæ mixed with a few fungiform, cover the principal part of its entire surface. The lenticular papillæ are arranged in the shape of letter V as in man.

E. 132. The tongue and pharynx of a man injected with vermilion. The nares, soft palate, surface of the tongue, the openings of the Eustachian tubes, the epiglottis and rima glottidis are all exhibited.

E. 140. The stomach and intestine of an *echinus esculentus*. The canal leads from Aristotle's lantern to the anus; its structure is remarkably thin and membranous. The ovaries are also seen in this preparation.

E. 144. The digestive organs of a snail, (*Helix pomatia*.) The stomach is large and oval-shaped, and leads into an intestine which forms two curves in the substance of the liver, and terminates on the right side of the shell. Two salivary glands are placed on the surface of the stomach, and connected to the mouth by long ducts. The liver is very large, and divided into four lobes.

E. 145. The organs of digestion of a limpet, (*Patella*.)

E. 146. The organs of digestion of a doris.

E. 148. The digestive organs of a cuttle-fish, (*Sepia loligo*.) There are two stomachs—the first is pyramidal, very muscular and lined with cuticle; the second is very long and delicate in texture: it communicates with the former by means of a very small opening surrounded by muscle. The rectum is very short, communicates with the anterior part of the second stomach, and opens into the infundibulum. The first stomach is usually found to contain a quantity of undigested fish; but the second, which probably acts the part

of a small intestine, only contains a whitish milky fluid analogous to chyle : this preparation is injected with vermilion.

E. 148. The digestive organs of the duck barnacle, (*Lepas anatifera*.)

E. 152. The organs of digestion of a leech, (*Hirudo medicinalis*.) There are three horny serrated teeth in the mouth. The intestine passes through the body in a straight line, and ends in an anus not larger than a pin hole. The canal gives off sacculi along its entire extent ; these increase in size from before, backwards—the last pair being long and extending on each side of the intestine.

E. 153. A longitudinal section of a leech : to show the sacculi in their distended state.

E. 154. The stomach of a lobster, (*Cancer gammarus*,) dried. It is a large globular cavity ; the sides of which are prevented from collapsing by plates of shell. In its interior there are three calcareous masses near the pylorus, which perform the functions of teeth.

E. 157. A portion of the intestinal canal of a sturgeon, (*Asci-penser sturio*) exhibiting its spiral fold. The surface of the intestine presents a honey-combed appearance ; but the fold is smooth. A piece of black paper marks the course of the canal.

E. 158. Another portion of the intestine of the sturgeon : to show the remarkable honey-combed arrangement of the mucous membrane, and the absence of the fold.

E. 159 The pancreas of a sturgeon ; it is an oval-shaped organ about the size of the human spleen, connected to the duodenum by a wide opening ; and filled with tubes covered by a fibrous capsule.

E. 162. The digestive canal of a salmon, (*Salmo trutta*.) It consists of a very simple, narrow, fleshy stomach, and a very short intestinal canal : along the duodenum are arranged the duodenal appendages.

E. 163. The stomach of mullet, (*Mugil cephalus*.) The œsophagus gives off from its side an oval membranous bag like a crop : a solid glandular gizzard surrounds the canal, and from it is given off numerous wide cœcal appendages : the crop was nearly filled with sand and shells.

E. 164. The stomach of the lump fish, (*Cyclopterus lumpus*.) The œsophagus is very wide ; the stomach simple, and but slightly contracted in the middle.

E. 165. The pyloric appendages of the lump fish : they are large

and numerous, several being united together so as to enter the intestine by a common tube.

E. 166. A portion of the peritoneum of a fish : to show its black colour.

E. 171. The intestinal canal and liver of a frog, (*Rana temporaria*.)

E. 172. The intestines of a tadpole in situ.

E. 173. The intestines of a tadpole dissected : to show their great length.

E. 174. A portion of the intestine of the turtle, (*Testudo mydas*.) This preparation shows the longitudinal folds of the mucous membrane, the small caliber of the intestine, and the remarkable thickness of its walls ; it is well injected with vermilion.

E. 175. The œsophagus of a turtle, (*Testudo mydas*.) The entire mucous membrane is covered with numerous sharp horny papillæ ; the apices of which are directed towards the stomach.

E. 176. The digestive canal of a tortoise, (*Testudo greca*.) The stomach is simple ; the small and large intestines are well exhibited. The ilio-cœcal orifice is surrounded by a circular fold, similar to the pyloric valve of the human stomach.

E. 184. The ventriculus succenturiatus and gizzard of a swan, (*Anas cygnus*.) The œsophageal glands are well marked in this preparation.

E. 185. The œsophagus of a crane, (*Ardea grus*.)

E. 186. A portion of the small intestine of an ostrich, (*Struthio camelus*), finely injected ; the villi are long and well marked.

E. 187. A portion of the large intestine of an ostrich inflated and dried ; it presents numerous valves with crescentic edges, which occupy more than half the circumference of the intestine, but do not form a spiral fold.

E. 188. A portion of the peritoneum of an ostrich, to show its black colour.

E. 189. The digestive organs of a cock, (*Phasianus gallus*.) They consist of œsophagus, ventriculus succenturiatus, crop, gizzard, small and large intestine, with two long cæca, and a short rectum.

E. 190. The stomach of an owl, (*Strix otus*), it is a membranous bag, presenting on each side a small flat tendon, from which the muscular fibres radiate over the entire surface, thus resembling in a minor degree the structure of a gizzard.

E. 191. The œsophagus and stomach of an emeu, (*Struthio casu-*

arius.) The œsophagus is long and wide, and ends into a large oval cavity, or gizzard; this is composed of muscular structure, and was lined with thick cuticle. (E. 193.)

E. 192. The cæca of an emeu; they are about four inches long, but not wider than a goose quill.

E. 193. The cuticular covering of the emeu's gizzard; it is hard and horny; its surface is thrown into numerous ridges, which for the most part run longitudinally, but a few run semi-circularly, near the pylorus.

E. 194. The anal gland of a shieldrake, (*Anas tadorna*.)

E. 200. The stomach of a seal, (*Phoca vitulina*,) it is a simple, funnel-shaped cavity; the œsophagus enters so much to the left side, as to leave a very small fundus; its walls are very muscular.

E. 201. The cæcum of a seal: it is very small and short.

E. 202. The stomach of a porpoise, (*Delphinus phocœna*,) its four cavities are well seen; the first is large and flask-shaped, but the others are short and narrow.

E. 203. The stomach of the peccary, (*Sus tagussu*.) The stomach is composed of three compartments, one very large behind, which presents two crescentic ears, one on each side; the second or middle compartment is oval-shaped, and receives the œsophagus at its upper and back part; the third compartment is pyramidal, and ends by contracting into a narrow pylorus: the three compartments communicate by such wide openings, that they can scarcely be considered as separate stomachs.

E. 204. The cæcum of a peccary: it is small and simple, ending in a pointed extremity; the ilio-cœcal valve is composed of two lips, not unlike the human.

E. 205. The stomach of a foetal calf, (*bos taurus*.)

E. 206. The stomach of a lamb, (*Ovis aries*.) The œsophagus and the four stomachs of ruminant animals are well seen.

E. 207. A hair ball from the stomach of a sheep.

E. 208. A hair ball from the stomach of a lamb.

E. 209. A portion of cuticle from the paunch of a dromedary, to show its thickness and opacity.

E. 210. The stomach of a rat, (*Mus rattus*,) it is divided into two portions; the cardiac extremity is covered with thick cuticle, but the pyloric is highly vascular, soft, and villous; a circular line separates the one from the other.

E. 211. The stomach and intestines of a rat; they are inflated and dried; the size of the large intestine and cæcum are well seen.

E. 212. The stomach and intestines of a squirrel, (*Sciurus vulgaris*.) The œsophagus enters about the middle of the stomach, but the left end is very largely dilated; the cæcum is large.

E. 213. The stomach of a hare, (*Lepus timidus*.)

E. 214. The stomach of a capybara, (*Cavia capybara*.) This is a simple cavity; the œsophagus enters midway between the great extremity and the pylorus.

E. 215. The cæcum of a capybara: this is at least five times as large as the stomach, being about four feet long: a few slight semi-lunar folds of mucous membrane are the only rudiments of the spiral fold of the other rodentia.

E. 216. The cæcum of a hare, (*Lepus timidus*.)

E. 217. The cæcum of a rabbit (*Lepus cuniculus*), inflated and dried, to show the beautiful spiral fold in its interior.

E. 118. The stomach of a cat, (*Felis catus*), it is a simple cavity of moderate size; inflated and dried.

E. 119. The cæcum of a cat; it is very small and terminates in a point.

E. 120. The stomach of a cat laid open; the mucous membrane is soft and smooth, and throw into longitudinal, temporary rugæ; it was full of bread and milk at the time of death.

E. 221. The cæcum of a cat laid open, to show the ilio-cæcal opening; this is not larger than a probe, prominent and circular, but not valvular.

E. 222. The stomach of a pig, (*Sus scropha*), it is a large oval cavity, and has an ear-shaped appendage attached to its left extremity, only separated from its cavity by a partial crescentic septum.

E. 223. The cæcum of a pig; it is very small and simple.

E. 224. The stomach of a monkey; its shape is similar to that of the human subject, but thicker and more conical.

E. 225. The cæcum of a monkey; it is large, not unlike that of man, but destitute of vermiform appendix; only one lip of the ilio-cæcal valve is developed.

E. 225*a*. The cæcum of a prehensile-tailed monkey; it is small, and no valve separates it from the small intestine.

E. 225*b*. The cæcum of a monkey; similar structure.

E. 226. The stomach and intestines of a bat, (*vespertilio murinus*.)

The stomach is simple, globular, and its orifices are close to each other; the intestines are simple and short, not divided into large and small, consequently without a cæcum. This is a good example of the organs of digestion of an insectivorous animal.

E. 227. The liver of a monkey; it is divided into a number of lobes, but is otherwise not unlike the human liver.

E. 228. The spleen, pancreas, and duodenum of a monkey injected; no valvulæ conniventes, and but few villi are visible. The opening of the pancreatic gland is marked by a bristle.

E. 230. The anal gland and pouch of a badger, (*Meles vulgaris*.)

E. 245. The stomach of human subject.

E. 246. The human cœcum inflated and dried.

E. 247. The human cœcum laid open to show the ilio-cæcal valve.

E. 248. The stomach of a human fœtus.

E. 249. The cœcum of a human fœtus.

E. 250. The cœcum of a human fœtus at the 4th month.

E. 251. The stomach, large and small intestines of a boy, injected and dried.

E. 252. A part of the human duodenum injected, to show the valvulæ conniventes.

E. 253. A portion of the human ilium dried, to show its valvulæ conniventes.

E. 254. A portion of the ilium injected and inverted, to show its mucous coat.

E. 256. The human spleen, to show its internal structure, the corpuscles are well exhibited.

PATHOLOGY OF THE ORGANS OF DIGESTION.

F. 1. A salivary calculus from a calf.

F. 2. Sections of two salivary calculi from a calf, to show the interior, which has a cellular structure.—(Dr. Neligan.)

F. 6. A fibrous tumour attached to the lower jaw : it is about the size of an egg and surrounds the angle of the lower jaw, which is perfectly healthy in its structure.

F. 15. An ulcer of the stomach which has perforated its coats. The mucous membrane, around the edge of the ulcer, which is about the size of a shilling, is corroded and irregular. The individual suffered from symptoms of most severe gastrodynia during life.

F. 16. Scirrhus of the pylorus. A considerable mass of semi-cartilaginous structure surrounds the pylorus, and includes the pyloric valve, which is very much thickened ; the surface towards the interior is ulcerated to a considerable extent.

F. 17. An enormous mass of scirrhus, the breadth of the hand and about two inches thick, extends from the centre of the stomach to the pylorus, which it overlaps and contracts ; the mass is cut into and presents a smooth gristly appearance, without any admixture of fibrous bands : the cardiac extremity of the stomach is much enlarged and thinned in its coats. The pylorus is converted into a crescentic shape.

F. 18. Scirrhus of the head of the pancreas and pyloric extremity of the stomach. A section has been made through the schirrous mass, which is extremely dense in its structure, and presents numerous fibrous bands, and is at least an inch and a half in thickness. The stomach is laid open to show the ulceration of its pyloric extremity, surrounded by irregular fringes of mucous membrane ; the remainder of the stomach and pancreas were healthy. The patient died of fever.

F. 19. A large cauliflower excrescence of the stomach. This is situated in the concave margin of the stomach, is very rough and ragged on its surface : the stomach is not enlarged, but its mucous membrane is thrown into numerous irregular folds.

F. 20. Rupture of the ilium from direct violence. A woman, aged 40, received a slight blow on the abdomen from her husband,

which was followed by pain in the part radiating over the entire abdomen; this was followed by coldness, sickness and vomiting, and she died in 27 hours. P.M.—The intestines were glued together with lymph, the peritoneum contained serum, lymph and feces; the latter had passed into it through an opening in the ilium, which is small and has irregular and torn but not thickened edges. The parieties of the abdomen were remarkably thin, presenting merely a trace of muscular fibre—this probably explains the rupture being caused by so slight an injury. She had borne several children—(*See New Dublin Journal, No. I.*)—Donor, Dr. Woodroffe.

F. 20a. A portion of a colon presenting a round ulcerated opening, with nearly smooth edges; it lies in a depression surrounded by an irregular elevation of the mucous membrane, and was slightly vascular in the recent state. This was taken from a woman who had eaten some pork pie for supper on the night of her marriage, was shortly after attacked with symptoms of peritonitis, pain, retching, constipation, cold extremities, anxious countenance, and small hard pulse; she had been in perfect health until that night, but she died in 16 hours after the attack. She had never suffered much from indigestion or pain in the abdomen previously.—Donor, Dr. Bailey.

F. 21. A portion of the small intestines of a child studded with scrofulous ulcers. The preparation is injected, and shows the highly vascular state of the margins of the ulcers, whilst the uninjected scrofulous matter fills the ulcers themselves. The mesentery contains similar masses of scrofulous structure.

F. 22. Stricture and ulceration of the rectum from cancer. The caliber of the intestine was almost entirely obliterated by dense fibrous structure; the disease is situated about one inch and a half from the anus; two small ulcerated openings are placed about two inches above the stricture, through which the feces escaped into the lower part of the peritoneal cavity, causing thereby peritonitis and death.

F. 30. The sac of a femoral hernia: it contains a large mass of omentum, connected to the sac by several bands of lymph; the omentum appears perfectly healthy.

F. 32. A verly large sac of a scrotal hernia; the tunica vaginalis and testis is seen inferior to the hernia; on the testis a hydatid is placed.

F. 40. A small bony tubercle attached by a pedicle of the peritoneum to the omentum, which was perfectly healthy.

F. 41. Intus-susception of the human ilium, caused by a mass of fungus growing from the mucous membrane ; it nearly filled the caliber of the intestine.

F. 42. Intus-susception of the intestine of a dog.

F. 43. Numerous ulcers on the mucous membrane of a turtle ; they are filled with a black deposit.

F. 50. Acute abscess of the liver. The cavity is lined by an exceedingly fine membrane ; it is situated in the left lobe.

F. 51. Chronic abscess of the right lobe of the liver ; it is about the size of a nutmeg, and lined by a thick membrane ; several smaller cavities communicate with it.

F. 52. Cirrhosis of the liver ; the right lobe is round, thickened, and irregularly tuberculated on the surface ; the lobulous spigellii and lob. caudatus are much enlarged ; the gall bladder is thickened and contracted, but contained healthy bile.

F. 53. A section of a liver filled with scrofulous tubercles ; they are small and yellow, but thickly set through the entire structure of the liver, which was much enlarged.

F. 54. Cancerous tubercles of the liver ; they are small but numerous, of a white colour, and moderately dense.

F. 56. A fibrous cyst attached to the under surface of the liver.

F. 57. A cyst the size of a nutmeg, taken from the liver of a camel ; its walls are calcareous, about the eighth of an inch thick, and were filled with the most foetid puss.

F. 66. A gall bladder containing a single cholesterine calculus ; it is white and semi-transparent.

F. 67. Ten calculi pure white, and nodulated on the surface, of a dark colour, and fibrous appearance in the interior.

F. 68. Thirteen calculi of different varieties ; two are of cholesterine, one of which is transparent, and contains in its centre a small black nodule, of the size of the head of a pin.

F. 69. A jar containing six calculi ; one is nearly pure cholesterine ; two others are covered with small nodules, except where fascetts have been worn on them by attrition ; the other three are cubical in shape, and of small size.

F. 70. A gall bladder containing one hundred and eleven calculi of small size, and nearly cubical in shape ; the bladder was healthy.

F. 71. A jar containing six biliary calculi ; one of them has been divided, it contains a mass of colouring matter in the centre, which was very soft in the recent state.

F. 72. A gall bladder of an irregular figure of eight shape, completely filled by a calculus; a section shows that it was composed chiefly of masses of cholesterine; no bile could have entered the bladder.

F. 73. A gall bladder filled with calculi, packed tightly together.

F. 74. Fourteen calculi; two are of the size of a nut, the others are very small; they are remarkable for their very black colour, are rough and nodulated on the surface, and were very soft when first removed.

F. 75. A gall bladder; to the interior of which is attached by close adhesions, a mass of calculus composed in some places of yellow colouring matter, and in others of white cholesterine; the bladder is very small, and is thickened and irregular on the surface; taken from the body of a person who died of pneumonia.

F. 76. Cholesterine for human bile.—Donor, Dr. Neligan.

F. 77. Twenty-five biliary calculi; they are small and cubical.

F. 90. An irregular distribution of the hepatic ducts, which unite separately with the cystic duct, to form the ductus communis. This preparation shows the normal shape and structure of the neck of the gall bladder, &c.

ORGANS OF CIRCULATION.

G. 3. The heart of a limpet, (*Patella vulgata*.)

G. 4. The veins of a limpet injected with mercury; a venous circle is seen surrounding the base of the branchiæ.

G. 5. The heart of a doris.

G. 6. The aorta of a snail, and its branches injected with vermillion.

G. 7. The same injected with mercury; the ascending aorta passing to the head, and the descending to the liver, are well seen.

G. 10. The three hearts of a cuttlefish, (*sepia loligo*;) the central one which is systemic is laid open to show its carneæ columnæ, and the valves at its orifices; it is tinged red with vermillion. The pulmonic hearts tinged blue, are quadrilateral and flattened.

G. 12. The heart of the angel shark, (*Squalus squatina*.) The auricle is very large and thin, a valve separates it from the ventricle;

The ventricle is very thick and muscular with thick *carneæ columnæ* ; three rows of valves are seen in the aortic bulb.

G. 13. The heart of a sturgeon, (*ascipenser sturio* ;) its cavities are laid open to show its interior ; the auricle is very irregular in shape and very thin ; the ventricle is thick and triangular ; the pedicle has two rows of semi-lunar valves, with three valves to each row.

G. 14. A portion of the spine of a sturgeon, to show the canal for the aorta ; this canal is at first superficial, but gradually becomes completely embedded in the cartilaginous structure of the *vertebræ*, where it is placed in front of that for the spinal marrow.

G. 18. The gills of a cod, (*Gadus morrhua*,) to exhibit its circulation ; the pulmonary artery injected red, and the origins of the aorta injected yellow, run in grooves along the convexities of the osseous *laminæ* of the *branchiæ*.

G. 19. The gills of the haddock, (*Gadus æglifinus*,) injected with size and vermilion, to show their extreme vascularity.

G. 22. The heart of a turtle, (*Testuda mydas*,) it is broader than long ; the ventricle is thick and muscular, and is connected by its apex to the pericardium, by means of several tendinous cords.

G. 23 The heart of a turtle ; its cavities are laid open to exhibit the two small auricles, one pulmonary, the other systemic ; placed at the upper part of the ventricle. The ventricle which is large and remarkably muscular, is divided into two cavities by a partial septum, perforated at its upper part. The pulmonary and systemic auricles communicate with the opposite sides of this ventricle, but both the aorta and pulmonary arteries arise from the systemic compartment. Glass tubes have been introduced into the vessels to show their origin.

G. 25. The heart and arterial system of a frog, (*Rana temporaria*.) The aorta is seen arising by two branches which pass round the *œsophagus* to unite on the front of the spine, and form the descending aorta ; the branches given to the lungs and those to the viscera are also seen, as well as little bulgings on the carotids, where the arteries were given off to the gills, in the tadpole state.

G. 27. The heart of a serpent ; this is long and narrow, flattened from side to side.

G. 30. The heart of a crane, (*Ardea grus*,) to shew the structure of the heart in birds ; it is conical and narrow ; the auricles are smaller than in mammalia ; the left ventricle forms the principal part, and is of the same shape as the heart itself, and exhibits in its

interior numerous carneæ columnæ, which all run in a longitudinal direction. The pulmonic ventricle envelopes the systemic, but does not extend to the apex of the heart, it is smooth and destitute of carneæ columnæ; the right auriculo-ventricular valve is well seen, being of a semilunar shape, fleshy and muscular, lying along the anterior border of the auriculo-ventricular opening.

G. 33. The heart of a seal, (*Phoca vitulina*.) it is short and broad; the auricles are fleshy and large, especially the left; the left ventricle is very thick and strong; the arch of the aorta with its three branches, the pulmonary artery, and the ductus arteriosus are all exhibited.

G. 34. The heart of the otter, (*Lutra vulgaris*.) it is remarkable for the size of its right auricle.

G. 37. The heart of a human foetus. This preparation exhibits the peculiarities of the foetal heart: the right and left auricles are laid open, to show the foramen ovale and its valve; the aorta, pulmonary artery, and ductus arteriosus are well seen.

G. 42. The adult human heart: the cavities have been laid open, to show the valves and orifices of the four cavities, as well as the relative thickness and peculiarities of the walls of each.

G. 43. A wax cast of the interior of the human heart, and great vessels arising from it; that of the right cavities is coloured green, that of the left, red; the two casts are completely separate from each other, being merely laid in apposition.

G. 49. A preparation to exhibit the vascular system of the human foetus; the umbilical vein and ductus venosus are coloured blue; the vena porta yellow, and its junction with the branch of the umbilical vein is well seen; the venæ cavæ hepaticæ and vena cava itself are coloured black; the arterial system and umbilical arteries are red; and the ductus arteriosus green.

G. 52. A preparation showing the internal carotid artery and its branches: the ophthalmic, &c.

G. 53. A dried preparation of the arteries of the head and face.

G. 54. A preparation of the arteries, the thorax, head and neck.

G. 55. A preparation of the arteries of the scapula and upper extremity.

G. 56. A preparation of the arteries and veins of the superior extremity.

G. 57. A preparation of the arteries of the fore-arm and hand.

G. 58. A preparation: showing an irregular distribution of the

ulnar artery. The humeral divided into its radial and ulnar branches above the middle of the arm. At the elbow both branches became superficial, passing over the muscles, and running to the inside and outside of the fore-arm. The radial gave off the interosseal branch.

G. 59. The arteries of the human hand, beautifully injected and dried.

G. 60. The arteries of the fore-arm of a child.

G. 62. The arteries of the pelvis, bladder and penis, injected.

G. 63. The arteries and veins, both superficial and deep, of the pelvis, thigh and penis, are injected.

G. 64. A preparation of the arteries of the inferior extremity injected.

G. 65. The arteries of the inferior extremity, and pelvis of a boy, injected. In this preparation, the obturator artery takes an irregular origin from the epigastric, and passes into the pelvis along the outside of the femoral ring.

G. 66. Arteries of the pelvis, and inferior extremity of a boy; in this specimen the posterior tibial divides into an internal superficial, and an external plantar artery. The superficial divides into four large branches, which run into the spaces between the toes, to which they distribute their branches; forming thus, a kind of superficial plantar arch as in the hand.

G. 67. The popliteal artery injected.

G. 68. The arteries of a human foot injected and dried.

G. 69. A preparation showing an irregular distribution of the pedal artery. It first gives off a small branch to the great toe, and then runs outwards in front of the cuboid bone—forming an arch convex outwards to end by anastomosing with the external planter between the second and third toes.

G. 73. The vascular system of a hedgehog, (*Erinaceus enropeus*.) The arteries distributed to the skin and its muscles are well injected.

G. 74. The foot of a horse injected.

G. 75. The arteries and veins of a human placenta injected and corroded. The arteries and veins terminate in a lash of branches of an irregular brush-like appearance.

G. 80. Two specimens of capillary vessels injected with vermilion.

G. 82. The spiral vessels of a plant arranged, to show their microscopic structure. They present a remarkably spiral or cork-skrew appearance, analogous to the structure of the trachea of animals.

G. 84. The aorta of a camel dissected, to show its coats.

G. 85. A human vena cava dissected.

G. 86. A human aorta dissected, to show its several coats.

The lacteals of a turtle, (*Testudo mydas*,) filled with mercury. The surface of the intestine for several feet is beautifully covered with minute ramifications of them. The arteries are filled with red, and the veins with yellow wax.

G. 96. The lymphatic gland of a turtle.

G. 99. The lymphatics of a portion of the human liver filled with mercury: they are arranged in an arborescent form on its surface.

G. 100. A similar preparation.

PATHOLOGY OF THE VASCULAR SYSTEM.

H. 1. The heart of the anen-cephalous foetus, (U. 53.) The right auricle is much dilated, and opens freely into both the right and left ventricle, the left auricle being absent. The two ventricles communicate by means of a circular orifice, the size of a crow-quill, in the upper part of the septum. Immediately above this opening, arises the aorta, which thus appears to arise from both ventricles, but much more from the right than the left. The aorta is of large size, and gives off a large ductus arteriosus, by which the blood is conveyed into the right and left pulmonary artery: the trunk of the pulmonary artery exists, but terminates in a cul de sac, without opening into the heart; it lies to the left of the aorta, so that the lungs must have received all their blood from the ductus arteriosus: this anomaly corresponds in a great degree to the normal arrangement of the circulation in the reptile tribe. The opening in the septum is marked by a red bristle; and the pulmonary artery and its two branches by black ones: the aorta is laid open.

H. 2. The heart of a middle-aged female, presenting a remarkable irregularity of the vena cava superior: this vein, taking its usual origin, passes down on the back of the left auricle, but without communicating with it, and enters into the left side of the right auricle at its lower part, near the usual point of entrance of the coronary

vein: the right auricle wants its appendix. Both sides of the heart are feeble and attenuated, and the subject from which it was taken was extremely emaciated.

H. 6. The arch of the aorta of an adult, from which only two trunks took their origin; the one on the right side gives off the innominate and the left carotid; the left subclavian constitutes the second trunk.

H. 7. A similar irregularity from a young subject.

H. 8. A preparation of an irregular origin of the right subclavian artery: it arises from the left side of the arch of the aorta, below the left subclavian, and then passes to the right axilla, crossing behind the œsophagus and trachea, so as apparently to compress that tube. It also passes behind both the right and left eighth pairs of nerves; but the right recurrent does not hook round it.

H. 12. Acute pericarditis. The entire heart is covered with a layer of lymph, presenting a honeycomb appearance; it is not hypertrophied.

H. 13. Chronic pericarditis. The pericardium is attached to the heart by old and strong adhesions; these are very short, and must have prevented the motion of the heart to a considerable extent; the heart is not hypertrophied.

H. 14. Enormous dilatation of the right and left auricles; the left ventricle is slightly dilated, but not hypertrophied.

H. 18. The heart of a turkey. The pericardium was covered on both surfaces by a hair-powdery deposit, some of which is still adherent to the heart, but a good deal, not being adherent, was washed out. The heart is soft and wrinkled on the surface. The turkey had received a blow about two months before its death, and gradually wasted away.

H. 19. The heart of a female, aged 23 years, presenting contraction of the left auriculo-ventricular opening, by the adhesion of the lips of the mitral valve; the orifice is oval, and would not admit the point of the little finger. The right ventricular valves are very slightly thickened, and the right side of the heart is loaded with fat.

H. 20. A portion of the left ventricle of a heart, the mitral valves of which are united and thickened, so as to present a narrow semilunar opening, about 8 lines in length.—Donor, Dr. Jephson.

H. 21. A heart presenting considerable hypertrophy and dilatation of the left ventricle. The aortic semilunar valves are thickened

from a deposit of bony matter along their free margins ; the mitral valves are healthy.

H. 22. The heart of a female, aged 65. The walls of the right ventricle are almost entirely covered with a thick layer of fat, which presents a solid firm texture ; the muscle which lies under the fat is only about one-fifth of its natural thickness, but possesses its normal structure ; the pericardium was dry, and coated with red recent lymph ; the left ventricle is slightly enlarged. The woman was taken into Jervis street Hospital in a dying state, her pulse being imperceptible, and the heart's action inaudible ; she had cancer of the uterus.—Donor, Dr. Neligan.

H. 23. A heart presenting the appearance of two semilunar valves to the aorta. The orifice is slit-shaped ; the valves are of *equal size*, very much thickened and irregular, from deposits of bone and lymph on their concave surfaces ; the mitral valves are thickened, and have large masses of bone on their ventricular surfaces ; the left ventricle is very slightly hypertrophied ; at first sight it would appear as if this was merely a union of the edges of two of the semilunar valves, but in that case one of the valves should be twice as large as the other.

H. 25. An aorta presenting a dilatation about the size of the fist at its arch ; its interior is puckered, being lined by its serous membrane ; the valves are not diseased, but the left ventricle is enormously hypertrophied and dilated.

H. 26. A portion of an abdominal aorta ; in some parts covered by bony plates, in others by flakes of lymph adherent to its surface, one large flake fills the left iliac artery ; the bony plates are in some parts covered by the lining membrane, in others they project through its structure into the cavity of the artery.

H. 27. An aorta covered with atheromatous deposit, and flakes of lymph under its serous coat. The disease commences at its origin, and extends its entire length ; the semilunar valves are not thickened, but have several flakes of lymph attached to their surfaces ; the heart is scarcely enlarged, and otherwise healthy.

H. 28. A dilatation of the transverse portion of the arch of the aorta : it extends from the centre of the arch to within about one inch and a half of the origin of the aorta ; and is, therefore, to a considerable extent, covered by the serous layer of the pericardium. The vessel has been laid open posteriorly, and shows the dilatation which principally occupies its anterior part ; this is filled by a large laminated

coagulum, which adheres to its walls with a considerable degree of firmness, and is smooth as if lined on its free surface by a serous membrane. The artery is not very unhealthy, except a few spots of atheroma; in the same preparation is seen another dilatation at the termination of the arch; it was almost entirely enveloped by the tissue of the left lung which adhered firmly to its surface. The walls of this dilatation are very irregular, but not thick; and its cavity contains a large irregular clot, not adherent to its walls; this was much softer and redder than that contained in the other dilatation.

H. 29. A continuation of the same aorta, presenting two dilatations opposite to the origin of the cæliac axis, one on either side of the vessel; each was filled with a coagulum in the recent state; but the centre of the vessel was free for the passage of the blood.

H. 30. A true aneurism of the arch of the aorta, about three inches in diameter; it arises from the back part of the vessel by a very large orifice, and presses backwards on the trachea, which is thus rendered concave anteriorly. The entire cavity is filled by a coagulum, slightly adherent to its walls. The trachea is laid open, to show four small orifices, none of them larger than a probe, leading into the sac, through which bristles have been passed; these openings are nearly filled by lymph; there is no appearance of sloughing on any part of the mucous membrane: this preparation was taken from a soldier, who, for many years, laboured under the ordinary symptoms of aneurism, the mucous expectoration being slightly tinged with blood. He died, (not of hæmorrhage,) but from the constant irritation.—Donor, Dr. Jephson.

H. 31. A very large false aneurism of the termination of the arch of the aorta: the orifice is smooth, and about the size of the thumb, but six lines from the orifice the surface becomes rough and covered by laminæ of lymph; the remainder of the aorta is healthy.

H. 32. Aneurism of the aorta at the left side of the arch arising from the back part of the artery, immediately above the root of the left lung: the orifice is smooth, but puckered, about the size of the point of the little finger; the sac, which is the size of a child's fist, extends backwards behind the œsophagus, to the bronchial tube of the right side, thus passing in front of the bodies of the vertebræ. The upper part of the aneurism is completely filled by a coagulum, but the lower part is smooth, and lined by a serous membrane: the aorta is nearly healthy in the neighbourhood of the aneurism. This

aneurism must have caused considerable difficulty of deglutition, but the history is not known.

H. 35. False aneurism of the abdominal aorta, arising from the back of the artery by a very large orifice, an inch in diameter, the edges of which are smooth, rounded and thickened. The interior of the cavity, which is of a very large size, is lined with thin flakes of lymph, and was filled by clots of fluid blood. The sac passed partly in front of the aorta, and appeared to have slightly flattened and compressed it; the aorta is considerably diseased, and the lumbar vertebræ were corroded to a considerable extent by the pressure—(see prep. D. 21.)

H. 36. A small aneurism, the size of a filbert, at the bifurcation of the aorta, the orifice is very small. The right iliac artery contains a large clot adherent to its walls.

H. 37. A dissecting aneurism of the right carotid artery. This vessel is completely filled by a clot of blood from its origin to its bifurcation; the clot lies between its internal and middle coats, the separation of which is seen in the preparation near its origin.

H. 41. Gangrene of the fingers. The ends of the fingers were black, shrivelled, and had the cuticle removed in vesicles of a dark colour; the radial and ulnar arteries are laid open and are filled with coagulum of lymph for about five inches above the wrist-joint—when recent, they were red and vascular.

H. 43. Ossification of the iliac, femoral, popliteal, tibial and fibular arteries. They are converted into complete bony canals, the fibres being arranged in rings forming nearly perfect circles round the vessels; the branches of the internal iliac were similarly affected, but the aorta and vessels of the upper extremity were nearly healthy. The ductus arteriosus contained a piece of ossific matter: taken from a man about 45 years of age, who died of fever.

ORGANS OF RESPIRATION.

I. 1. The respiratory apparatus of an insect.

I. 1*a*. The tracheæ or respiratory organs of a silk-worm: they are arranged for the microscope, and form a series of extremely delicate tubes radiating from a central large one; each tube is composed of a spiral thread, as in the spiral vessels of plants.

I. 1*b*. The tracheæ of the wing of an insect; the tubes are seen running longitudinally in the wing.

I. 2. The respiratory apparatus of a star-fish. Numerous small cylindrical tubes, filled with sea-water, extend along the furrows on the under surface of each of the arms, and act as respiratory organs—(seen in L. 1.)

I. 3. The respiratory organs of an echinus. They are composed of fine tentacula, arranged in five double rows on the external surface of the animal, and are capable of absorbing water freely.

I. 4. Respiratory organs of a sea-mouse, (*Aphrodita aculeata*.) A row of stigmata or openings, surrounded by strong bristles, lead into cœca, which lie in a cavity under the skin, into which the water enters by an orifice near the tail.

I. 5. Respiratory organs of the doris, composed of a tuft of branchiæ, each of which is divided into numerous branches situated round the anus.

I. 6. Respiratory organs of the patella.

I. 10. The respiratory organ of a snail, (*Helix hortensis*.) It is a simple cavity covered with vessels; the orifice of entrance, on the right side of the cloak, is marked by a bristle.

I. 11. One of the gills of a *sœpia* injected; it is composed of numerous laminæ, placed parallel to each other.

I. 14. The swimming bladder of a gurnard, (*Trigla lyra*.) It is a large bag divided into three compartments, which communicate with each other; it is laid open to show the interior. A second specimen shows the bladder closed.

I. 15. The swimming bladder of a pike. It is very long and narrow, and communicated with the œsophagus by a short narrow canal; it nearly as large as the stomach of the animal.

I. 19. Os-hyoides of a tortoise ; its body is shield-shaped, and has two cornua on each side.

I. 20. Trachea and lungs of a tortoise : the trachea is composed of rings which form complete circles and bifurcates into two bronchial tubes.

I. 24. A portion of the lung of a turtle.

I. 25. A portion of the same injected with vermilion, its cells are large and communicate freely with each other.

I. 26. The lungs of a toad injected ; they are two sacculi divided into very large cells by partitions, the anterior cells are smaller than the posterior.

I. 27. The larynx of a lizard.

I. 28. The larynx of a crocodile.

I. 30. The lungs of a chameleon, (*Lacerta chameleon*.) They are long bags divided into large cells by delicate walls, and resemble the lungs of the toad, the opening into the glottis is a simple slit without any epiglottis.

I. 32. The os-hyoides of a crane, (*Ardea grus*.)

I. 33. The os-hyoides of a gull, (*Larus carus*.)

I. 34. The os-hyoides of a goose, (*Anas anser*.)

I. 35. The os-hyoides of a hawk, (*Falco nisus*.)

I. 36. The tongue, trachea, superior and inferior larynx of a northern diver, (*Columbus glacialis*.) The trachea is dilated into an oval-shaped cavity, nearer to the inferior than the superior larynx ; this is composed of numerous rings of a very irregular shape ; below the trachea is divided into two by a septum, each tube communicates with the inferior larynx and terminates in one of the bronchial tubes.

I. 37. The trachea and larynx of the same laid open : the irregular tubes of which the bony larynx are formed are exposed.

I. 38. The trachea and larynx of a sheldrake, (*Anas tadorna*.) The inferior larynx is dilated into two circular cavities ; the left smaller than the right, each of which communicates with a bronchial tube.

I. 40. Trachea and larynx of a duck.

I. 41. The superior and inferior larynx of a duck laid open.

I. 42. The larynx of a goose.

I. 45. The trachea of a swan, (*Anas olor*,) it makes a remarkable contortion in the substance of the sternum, which is here laid open.

I. 46. The larynx of an emeu, (*Struthio casuarius*;) the rima

glottidis presents a triangular-shaped opening, its base towards the tongue, and is slightly overlapped by a triangular cartilaginous plate, a rudiment of the epiglottis; this however lies horizontal instead of perpendicular.

I. 50. The os hyoides of a dog, (*Canis familiaris*.)

I. 51. The os hyoides of a horse, (*Equus caballus*.)

I. 52. The os hyoides of a cat, (*Felis catus*.)

I. 53. The os hyoides of a porpoise, (*Delphinus phocæna*.)

I. 54. The os hyoides of a man, the body of which is much excavated.

I. 61. The larynx of a horse, (*Equus caballus*.)

I. 62. The larynx of a porpoise, (*Delphinus phocæna*.) The epiglottis and arytenoid cartilages are lengthened, so as to form a funnel-shaped tube, which ascends into the bag of the pharynx, towards the posterior nares.

I. 63. The larynx of a cat.

I. 64. The trachea of an ox, showing the muscular fibres on its back part.

I. 65. The larynx, os hyoides, and trachea of a monkey.

I. 70. The lungs of a human foetus filled with mercury.

I. 71. The lungs of a human foetus: the left lung is divided into three, and the right into four lobes. The child was otherwise well formed.

PATHOLOGY OF RESPIRATORY ORGANS.

K. 1. *Cynanchi trachealis*; a perfect tube of lymph lines the trachea, and extends into each bronchial tube for a short distance.

K. 2. *Phthisis laryngea*; a large abscess occupies the space between the thyroid and arytenoid cartilages; the epiglottis is converted into a round thickened tubercle, and the aryteno-epiglottidean folds are rough and half-an-inch thick, and thus convert the opening of the glottis into an irregular slit.

K. 3. The trachea of a man on whom tracheotomy had been performed; the opening is immediately below the isthmus of the thyroid gland; the surrounding mucous membrane is healthy.

K. 4. Two small ulcers of the larynx; they occupy the space behind the ventricles of the larynx: the edges of the ulcers are thick, and about half-an-inch in diameter.

K. 6. A jar containing two thyroid, and one cricoid cartilage completely converted into bone.

K. 7. A jar containing the thyroid and cricoid cartilage converted into bone.

K. 12. A dried specimen of sub-pleural emphysema of the lung.

K. 13. A very large specimen of sub-pleural emphysema of the lower margin of the lung, taken from a man who died of phthisis.

K. 14. Interlobular emphysema of the lung.

K. 15. A similar preparation.

K. 16. A portion of lung nearly black from melanotic deposit, a few tubes of white colour pass through it.

K. 17. A portion of lung taken from a patient who died of phlebetis: it is perfectly solid, and was of a red colour when recent; the pleura was adherent throughout, and pus exuded from the cut surface.

K. 31. A portion of the lung of an axis deer filled with solid tubercles.

K. 32. The lungs of a monkey studded with tubercles, and containing a cavity of the size of a nut on the back part.

K. 33. A small cavity which remained after the expulsion of tubercular matter; it is lined with lymph, and communicates with a bronchial tube.

K. 34. The lungs of a fowl; in the upper part of the left, is contained a mass of tubercle the size of a small walnut.

NERVOUS SYSTEM.

L. 1. Nervous system of a star-fish, (*Asterias rubens*.) A nervous circle surrounds the mouth, from this a nerve is given off to each of the arms, and distributes filaments to the muscular suckers in the ambulacral furrows.

L. 5. Nervous system of the lobster, (*Astacus marinus*.) The brain or super-œsophageal ganglion is seen giving off its branches to the organs of sense; the series of ganglia of the cephalo-thorax and post abdomen are raised on bits of blue paper, and the connecting nervous cords are well exhibited.

L. 6. The nervous system of a sea-mouse, (*Aphrodita aculeata*.) A long series of ganglia is seen on the abdominal surface of the animal, as well as the connecting nervous cords.

L. 7. The nervous system of a leech, (*Hirudo medicinalis*.) The abdominal ganglia, 24 in number, are seen with their connecting filaments.

L. 8. The nervous system of an earthworm, (*Lumbricus terrestris*.) Two longitudinal nervous cords extend the entire length of the animal; these are approximated so as to touch each other, and give off numerous branches to their skin and rudimentary feet.

L. 13. The nervous system of a limpet, (*Patella*.)

L. 14. The nervous system of a doris.

L. 16. The nervous system of a snail, (*Helix pomatia*.) The nervous circle surrounding the œsophagus, and the super and sub-œsophageal ganglia are exhibited; from the super-œsophageal ganglion is given off the branches to the eyes, tentacula, and muscles of the mouth; from the sub-œsophageal ganglion is given off a lash of branches to the foot and one to the stomach.

L. 23. The brain of a whiting, (*Gadus merlandus*.)

L. 24. The upper surface of the brain of a cod, (*Gadus morrhua*.) The anterior tubercles or olfactory lobes are seen giving off the long and slender olfactory nerves; behind these two tubercles represent the cerebral hemispheres, which are smaller than the next pair or the optic tubercles; the latter are identical with the corpora quadrigemina of mammalia. These are succeeded by the cerebellum, a broad lamina of gray substance, and triangular in shape, which overhangs the fourth ventricle.

L. 25. The brain of a cod seen from below: this shows the large size of the optic nerves, and the manner in which they completely decussate without uniting.

L. 26. The brain of an eel, (*Murena conger*.) The three pair of lobes or tubercles are nearly of equal size, the anterior or olfactory, the middle or cerebral, and the posterior or optic lobes; the cerebellum is well seen.

L. 27. The brain of a ray, (*Raia batis*;) in it the cerebral hemispheres or lobes are much larger than the optic lobes, and overlap them; the olfactory lobes are not in contact with the brain, but connected to it by thick peduncles; they lie on the cribriform plate of the ethmoid bone, and are very broad and large. The cerebellum is very large and highly developed, it presents a laminated structure in the centre, and small lateral hemispheres.

L. 34. The brain of a frog, (*Rana temporaria*.) Its anterior lobes are large and oval-shaped, succeeded by a very small pair of tubercles in the centre, the optic thalami, and a large pair on each side, the latter correspond to the optic tubercles of birds; behind these is placed a cerebellum.

L. 35. The brain and spinal marrow of a tadpole; the feet have appeared but not the arms. The cerebral hemispheres, optic thalami, and optic tubercles are seen, as in the last preparation, but are smaller

in size ; the cerebellum is merely rudimentary, and the spinal marrow is expanded posteriorly in the lumbar region.

L. 41. The brain of a duck : the cerebral hemispheres are large, broad and smooth on the surface, pointed in front, where they give rise to the mamillary processes from which the olfactory nerves take their origin ; the optic tubercles are seen on the *under and lateral part* of the brain. The cerebellum is well developed, laminated in the centre, and has two small lateral appendages.

L. 42. A perpendicular section of the brain of a goose ; this shows the lateral ventricles, the fourth ventricle, the hemispheres of the brain and cerebellum, and the optic lobes.

L. 43. A section of the brain of a goose, which especially exhibits the ventricle in the optic lobes.

L. 44. The nerves of the mandibles of the duck, (*Anas boschas.*) They are dissected to the free edge of the bill, and divided into a lash of branches freely distributed to the mucous membrane.

L. 48. The brain of a chick on the 6th day. The optic tubercles of *larger* size than the cerebral hemispheres and containing large ventricles, are seen on the upper surface of the brain, behind the hemispheres and overlapping the cerebellum behind, thus corresponding to the position of the same parts in fish.

L. 49. The brain and spinal marrow of a chick on the 9th day ; the position of the parts is the same as in the last preparation, but the optic tubercles are not larger than the hemispheres.

L. 51. The brain of a chick on the 14th day of incubation ; the hemispheres of the brain are larger than the optic tubercles ; the cerebellum is enlarged, and its anterior extremity has passed between the two optic tubercles, so as to throw them to each side ; as the cerebellum continues to enlarge, it gradually throws the optic tubercles more and more to the lateral parts, until in the adult fowl they are completely overlapped by the cerebellum, and they lie on its inferior and lateral part—as seen in L. 41.

L. 56. The brain of a porpoise, (*Delphinus phocœna* ;) this is remarkable for its globular shape, the numerous small convolutions on its surface, and the absence of the mamillary processes for the origin of the olfactory nerves ; the cerebellum is laminated, and presents vermiform processes, similar to those of man.

L. 57. The brain of a monkey ; the hemispheres of this brain are larger, and more completely cover the cerebellum, than in other

mammalia except man ; the brain differs from that of man in the shallowness of its sulci, and the absence of convolutions from its posterior lobes.

L. 58. The nerves of the whiskers of the seal, (*Phoca vitulina*;) the nerves are of a very large size, and have been traced into the hair bulbs.

L. 59. A preparation of a nerve deprived of its neurilema by immersion in an acid.

L. 60. The spinal marrow of a foetus at the 9th month.

L. 61. The cervical portion of the spinal marrow of an adult.

L. 62. A portion of the dorsal region of the spinal marrow, showing its arteries.

L. 63. The entire spinal marrow of an adult, the dura mater laid open.

L. 64. A portion of the spinal marrow, including the cauda equina of a man.

PATHOLOGY OF THE NERVOUS SYSTEM.

M. 1. A portion of the dura mater, lined by a layer of lymph, the result of acute inflammation.

M. 2. A large cavity in the anterior lobe of the brain : the dura mater which covered the part is lined by a layer of lymph, and presents a large irregular lacerated opening : the surface of the cavity is rough, and is also lined with lymph : a similar but smaller cavity is seen at the lateral part of the same lobe. The man died of this severe injury of the head.

M. 3. A large abscess at the surface of the brain, the cavity of which is covered by a layer of lymph, and was filled with pus in the recent state.

M. 4. A large fungus cerebri which still protrudes to a small extent above the surface of the brain. A cleft filled by a similar

fungus extends into the lateral ventricle. The protrusion took place after the operation of trephine, and the man had the usual symptoms of fungus cerebri.

M. 5. A very large clot of blood in the upper part of the pons varolii, extending from thence into the lateral and third ventricle. The man died of apoplexy, never having rallied after the first attack, which was characterised by profound coma.

M. 6. The brain and head of an idiot who was subject to epileptic fits for many years; the left hemisphere of the brain is not half the size of the right one; the space between the surface of the brain and the cranium being filled by a large cyst, which contained an albuminous fluid; the cyst communicates with the cavity of the lateral ventricle by a large aperture, indicated by a piece of tin foil; the face is covered with cicatrices, the result of a burn.

M. 7. The spinal marrow of M. B. compressed by a luxation and fracture of the seventh cervical vertebra, (see D. 140,) he lived three days after the accident.

M. 8. The brain of a kitten; a deep ulcer with ragged edges is seen on the lateral part of the pons varolii, which has destroyed the fifth pair of nerves at its root; the animal for some days before death was observed to rotate constantly to the right side, and then to turn head over heels; the eye of the right side is destroyed by sloughing of the cornea, (see N. 72.)—Donor, Dr. Jameson.

M. 9. A large fibrous tumour the size of a pigeon's egg, on the lateral part of the pons varolii, pressing on the anterior part of the cerebellum; it has caused atrophy of the seventh pair of nerves.

M. 10. The two choroid plexuses of a man who fell down suddenly, with symptoms of apoplexy; they each contain a quantity of yellow cheesy matter along their border. No other disease of the brain could be discovered.

M. 11. Injury of the ninth pair of nerves and cerebellum.

ORGAN OF VISION.

N. 1. Eye of cuttlefish.

N. 2. The eye of a skate, (*Raia batis*;) it presents an irregular shape, being flattened on one side, and is supported on a fibro-cartilaginous pedicle; the optic nerve and muscles of the eye are also exhibited.

N. 6. Eye of the angel shark, (*Squalus squatina*;) the silvery choroid and sclerotic are exhibited.

N. 7. The choroid body of the cod is shown surrounding the optic nerve.

N. 8. The choroid body of a cod dissected, to show its helix shape; in its interior is seen the entrance of the optic nerve, whilst from its circumference a beautiful plexus of vessels ramifies over the choroid coat.

N. 9. The beautiful silvery choroid of a cod: the cartilaginous sclerotic coat is also exhibited.

N. 10. The eye of the sturgeon, (*Ascipenser sturio*,) exhibiting the thickness of the cartilaginous sclerotic coat, and the outer surface of the silvery choroid.

N. 11. The eye of sturgeon, showing the iris which presents a silvery hue.

N. 12. The lenses of several fish dried.

N. 13. A lamina of a cod's lens, to exhibit its microscopic structure; it is composed of innumerable fibres, united by beautiful serrated edges, as described by Dr. Brewster.

N. 14. A similar preparation, put up to show the effect of Canada balsam on the fibres of the lens: the appearance of the serrated edges is nearly obliterated.

N. 20. The eye of a chameleon cut transversely.

N. 21. The eye of a chameleon cut longitudinally, to show the chambers of the eye.

N. 26. The eye of a crane, to show the ciliary processes and iris : the processes are beautifully small and delicate.

N. 27. The eye of an owl, to show the osseous plates of the sclerotic and the cornea preserved in oil of turpentine.

N. 28. The eye of an owl in spirits.

N. 28.* The eye of an owl dried.

N. 29. A preparation, showing the pecten of the goose's eye in two views. A vertical section of one has been made ; it shows the pecten in situ composed of ten folds, coloured black, especially where they pass forwards, towards the back of the lens. In the second section the pecten is seen surrounded by the retina at the entrance of the optic nerve.

N. 30. The eye of a parrot, to show the iris and the circular form of the pupil.

N. 35. The eye of a porpoise, to show the fibro-cartilaginous nature, and thickness of the sclerotic coat, and the colour of the choroid.

N. 36. The eyelids of a seal, to show the third eyelid.

N. 37. The eye of a seal, to show the thickness of the sclerotic and the tapetum.

N. 38. The eye of a horse, to show the lens in situ, and the chambers of the eye.

N. 39. The eye of a horse, showing the tapetum.

N. 35*a*. The eye of a horse, showing the iris ; it exhibits the three processes hanging from its upper edge.

N. 36*b*. The eye of a horse, showing the membrane Ruyschiana.

N. 37*c*. The eye of a horse, showing the ciliary ligament, ciliary body and processes.

N. 38*d*. The eye of a horse, showing the iris and lens in situ.

N. 39*e*. The ciliary processes of an ox's eye, injected with vermilion.

N. 40. The eye of an ox : the arteries of the choroid coat injected with mercury.

N. 41. The eye of an ox : the ciliary arteries injected with mercury.

N. 42. The eye of an ox : the ciliary vessels injected with vermilion.

N. 43. The retina of an ox, showing its vascular layer, injected with vermilion.

N. 45. The elastic cornea of a sheep's eye : it is almost invisible from its perfect transparency.

N. 46. The ciliary processes of the eye of an ox injected with vermilion.

N. 49. A section of the deer's eye, showing the retina.

N. 50. The eye of a hare, showing the lachrymal gland.

N. 54. The lens of the eye of a human foetus at 5th month : the posterior part of the capsule is injected with vermilion.

N. 55. A vertical section of the human eye and eyelids : all the structures of the eye and eyelids are exhibited..

N. 57. The choroid coat of the human eye.

N. 58. The lens and ciliary processes of the human eye.

N. 59. The lens and iris of the human eye.

N. 70. A human eye atrophied.

N. 71. The eye of a horse, showing a cataract.

N. 72. The eye of a kitten : the cornea has been destroyed by sloughing, and the lens opaque probably from destruction of the fifth pair of nerves. (See M. 8.)

ORGAN OF HEARING.

O. 1. Vestibular cavity of lobster, (*Astacus marinus* :) it is composed of a simple sac, situated at the base of the great antenna.

O. 2. The semicircular canals of the ear of a skate, (*Raia batis* ;) they are membranous, and lie loose in cartilaginous beds.

O. 4. The ear of a cod, (*Gadus morrhua*.) The vestibule, ossicula, and semicircular canals in situ, seen in L. 24.

O. 5. Membrana tympani of a frog, (*Rana temporaria* :) it is on the same level with the skin, but differs in colour.

O. 7. The single ossiculum or columella of the ear of a turtle, (*Testudo mydas*.)

O. 11. Tympanal cavity of seal's ears, showing the ossiculæ in situ.

O. 12. The cartilages and meatus auditorius of the seal's ear ; the latter was filled with cerumen, and completely concealed beneath the skin when in situ.

O. 13. The external auditory canal of a porpoise, (*Delphinus phocæna* :) the aperture is very small, so as to be seen with difficulty, and the tube very narrow.

O. 14. The internal ear of a porpoise.

O. 16. The ossa bullea of a cat's ear.

O. 17. The ossa bullea of a dog's ear.

O. 21. *Membrana tympani* of the human ear.

O. 22. The tympanal bones of human, exhibited in situ: the bones are coloured.

O. 23. The tympanum and vestibule, with the tympanal bones in situ.

O. 24. The semicircular canals and cochlea of the human ear.

O. 25. The *membrana tympani*, showing both its external and internal surfaces, and the malleus attached to its internal surface.

O. 26. The semicircular canals and cochlea of the human ear laid open.

O. 27. A preparation showing the mastoid cells by a vertical section.

O. 28. A preparation showing the inner wall of the tympanum.

O. 29. A preparation showing the vestibule cochlea and semicircular canals, as well as the middle ear.

O. 30. A temporal bone, showing the aqueducts of the cochlea and vestibule.

O. 31. A jar containing the tympanal bones articulated with each other.

O. 32. A section to show the mastoid cells by an antero-posterior section.

O. 33. The temporal bone of a foetus at the 5th month, to show its tympanal ring separated from the bone itself.

O. 34. The temporal bone at the 9th month, to show the tympanal ring attached.

O. 35. A section to show the opening of the Eustachian tube into the pharynx.

ORGANS OF SMELL.

P. 1. The nares of a tortoise.

P. 4. The nares of a sturgeon, (*Ascipenser sturio*;) it is a circular cavity, in the bottom of which numerous laminae radiate from a central axis to the circumference, leaving oval-shaped spaces between them; on these are expanded the olfactory nerves; the organ is protected by a cartilaginous process which partly covers the entrance of the cavity.

P. 5. The nares of the skate; it is composed of numerous transverse laminae, separated by narrow slits, united by a longitudinal band.

P. 6. A section of the sheep's head, shewing the spongy bones of the nares; they are very simple and few in number, and run from before backwards.

P. 7. A section showing the spongy bones of the seal; these are divided most minutely into delicate folii, which run from before backwards.

P. 8. The spongy bones of the dog exhibited by an antero-posterior section.

P. 9. The spongy bones of the badger exhibited by an antero-posterior section; the spongy bones radiate in very fine and numerous laminae.

P. 10. The external nares of the porpoise, (*Delphinus phocaena*,) commonly called the blowing hole; it is placed at the top of the head, and communicates with the back of the pharynx; the orifice is valvular, and its long diameter, the edges of which are grooved, runs transversely.

P. 11. The external nares of a seal, (*Phoca vitulina*;) the apertures are semilunar, slit-shaped, convex inwards, and remain closed, unless opened by the will of the animal.

P. 12. The septum narium of human nose injected with vermilion.

P. 13. A section of the human face, to show the meati narium, the frontal and sphenoidal sinuses, and the communication between the nose and pharynx, injected with vermilion.

P. 16. Section showing the spongy bones of the human nose.

P. 17. A section showing the antrum Highmoreanum, dried.

P. 19. A section showing the frontal sinuses of human subject, and their communication with the nose.

P. 23. Polypus of the middle meatus; it is attached to the middle spongy bone, and covers the orifice of the infundibulum presenting through the left nares; it is soft, broad, and flat.

P. 24. A beautiful specimen of cleft palate. The entire of the hard palate is absent, as well as the vomer; the soft palate is cleft, its margins being about half an inch apart, and the two halves of the uvula are an inch and a quarter asunder.

P. 25. A preparation showing a deficiency of the palate plates of the palate bones: the uvula was cleft, but not the palate, in the recent state.

The Organs of Taste are arranged with the DIGESTIVE Organs.

ORGAN OF TOUCH.

R. 1. A portion of the wing of (*Papilio brassica*,) to show the microscopic appearance of the scales.

R. 1*a*. Scales from the wing of the *lepisma* arranged for the microscope.

R. 1*b*. Scales from the wing of the *podura plumbea* arranged for the microscope.

R. 1*c*. Scales from the wing of the *Tenea vestianella* arranged for the microscope.

R. 2. A portion of the skin of caterpillar, to show its microscopic structure.

R. 3. A portion of the skin of a serpent partly deprived of the cuticle.

R. 4. The epidermis of a serpent, detached by moulting, dried.

R. 5. Epidermis of a serpent preserved in spirit.

R. 8. A specimen of the cutis vera of a tortoise; the inner surface of a portion of the cuticle is also displayed.

R. 9. The cutis vera of the foot of a tortoise.

R. 10. The cuticle of a tortoise's foot dried.

R. 11. A similar preparation in spirit.

R. 12. The skin of a chameleon; the cuticle is detached from a part of it, so as to display the cutis vera.

R. 16. The cuticle detached from a goose's foot.

R. 17. Feathers at different ages, to show their structure.

R. 18. Feathers of the emeu, arranged so as to show the bifurcation of their shaft.

R. 19. A mass of the feathers of the emeu.

R. 24. Cuticle from the toe of a camel.

R. 25. Cutis vera from the toe of a camel, to show its large papillæ.

- R. 26. The skin of a hedgehog dried.
- R. 27. The skin of the same prepared and preserved in spirit.
- R. 28. The quills of a porcupine, (*Histrix cristata*,) they are horny in their entire length.
- R. 30. Quills of a prehensile-tailed porcupine, (*Histrix prehensilis*.)
- R. 31. The dried skin of an agoutis, (*Chlosomys agoutis*.)
- R. 32. The dried skin of an axis deer, (*Cervus axis*.)
- R. 33. The dried skin of a capybara, (*Cavia capybara*.)
- R. 34. The dried skin of an armadillo.
- R. 35. The dried skin of a penguin, (*Aptenodytes Patagonica*.)
- R. 38. A portion of the skin of a foetus injected.
- R. 39. A portion of human skin, showing indelible marks from tattooing.
- R. 40. A portion of the skin of a negro, the cuticle is partly removed to show the rete mucosum.
- R. 41. A wet preparation of human cuticle; in this preparation the sudoriferous canals are well seen.
- R. 42. A dried preparation of the same.
- R. 42*a*. Human brown hair arranged, to show its microscopic structure.
- R. 42*b*. Human hair, white from age, to show its microscopic structure.
- R. 42*c*. White hair of a dog, arranged for the microscope.
- R. 42*d*. Hair of an armadillo, for the microscope.
- R. 42*e*. Hair of a capybara, (*Cavia capybara*,) arranged for the microscope.
- R. 42*f*. Hair of a mouse, (*Mus musculus*,) arranged for the microscope.
- R. 42*g*. Hair of a lemur catta, to show its microscopic structure.

PATHOLOGY OF SKIN, ETC.

R. 50. A toe-nail of enormous size taken from a female.

R. 51. A portion of the nail of the great toe of a female, sawed off; it is half an inch thick, and as hard as bone.

R. 52. A nail and cuticle of a finger detached by a burn, showing their connexion and continuity.

R. 53. A specimen of cancer scroti; it springs from the skin, is irregular on the surface, and very hard.

R. 54. A similar disease.—Donor, Dr. Neligan. Both specimens were taken from sweeps.

R. 55. Cancer of the lower lip.

R. 56. Cancer of the lower lip.

R. 60. A fungus growth from the subcutaneous cellular tissue of the thigh; it grows from the surface of a mass of fat, and presents a homogeneous structure; is moderately firm and elastic to the touch, and totally unconnected to the vastus muscle on which it lay; its surface is ulcerated: it commenced as a pimple ten years, and increased very slowly until two years, since, when it began to grow rapidly; it at the same time became painful, especially at night: the surface became abraded, and a sanious discharge took place from its surface; it was removed by Dr. Woodroffe, and the man recovered and has remained well.

R. 61. A large tumour removed from the thigh of a young man by Mr. Auchinleck; it was loosely attached, and is composed of numerous lobules, united by cellular septa; a section shows that its tissue is of a dense, smooth, semicartilaginous appearance. The thigh was after some time attacked with fungus hæmatodes of which the patient died.

URINARY AND GENITAL ORGANS.

S. 1. The genital organs of a leech (*Hirudo medicinalis*) are shown in L. 7.

S. 2. The genital organs of a snail; the male and female organs of the same animal: in one specimen the penis is seen coiled up on the neck; its relations to the stomach and organs of digestion are exposed: in the other specimen the penis is uncoiled, and hangs down to the extent of about three inches. The bladder, ovaries and the dart cavity are exhibited; the latter is laid open to expose the dart in its interior.

S. 5. The kidney of a tortoise.

S. 6. The kidney, bladder and penis of a tortoise; the bladder is large, thin and bifid, and communicates with the urethra by a large opening; the penis is large and furnished with a glans in front; the urethra is merely a groove, open on its dorsum, the edges of which are brought together when the organ is erect.

S. 7. A similar preparation of a small tortoise.

S. 7. The testis of a tortoise, (*Testudo greca* :) it is composed of numerous lobes, united together into a triangular mass.

S. 9. The ovaries of a tortoise, containing eggs of different sizes.

S. 12. Ovaries and oviducts of a hen, containing eggs in various stages of development, injected with vermilion.

S. 16. The kidney of a porpoise, (*Delphinus phocæna*,) composed of numerous lobules, united by loose cellular tissue.

S. 17. The kidney of a seal, presenting a nearly similar structure; it is much smaller, and its lobules more united by an external capsule of cellular tissue, than in the kidney of the porpoise.

S. 18. The kidney of an otter, (*Lutra vulgaris* :) it consists of numerous lobules.

S. 19. The kidney of an armadillo: it is nearly glubular, and composed of one lobe.

S. 20. The kidney of a capybara: it is composed of a single lobe, and has a very small pelvis.

S. 21. The kidney of a cat, (*Felis catus*), composed of a single lobe; the vessels on its surface are injected with mercury.

S. 22. The kidney of a foetal calf: it is multilobular.

S. 23. The kidney of a monkey injected: it is composed of a single lobe.

S. 24. A section of a horse's kidney, to show the tubuli uriniferi, beautifully injected yellow, prepared for the microscope.

S. 24*a*. A section of a horse's kidney, to show the arteries, injected with vermilion; arranged for the microscope.—Donor, Dr. Bennet.

S. 24*b*. A section of a cat's kidney, to show the arteries and veins; injected and arranged for the microscope.—Donor, Dr. Bennet.

S. 24*c*. A section of a cat's kidney, to show the veins on its surface; injected for the microscope.—Donor, Dr. Bennet.

S. 24*d*. A section of a cat's kidney, to show the arteries, injected red and the veins yellow; arranged for the microscope.—Donor, Dr. Bennet.

S. 24*e*. A section of the human kidney, to show the veins, injected yellow; arranged for the microscope.

S. 24*f*. A section of the human kidney; the arteries injected red, and the veins yellow; arranged for the microscope.

S. 24*g*. The veins of the human kidney, injected yellow; arranged for the microscope.

S. 24*h*. A similar preparation.

S. 24*i*. A section of a human kidney; the arteries and veins injected, and cut transversely for the microscope.—Donor, Dr. Bennet.

S. 24*k*. A section of a human kidney, to show arteries and veins; injected and arranged for the microscope.—Donor, Dr. Bennet.

S. 27. The kidney of a human foetus at the 5th month; it is multilobular, as in the lower mammalia.

S. 28. The kidney and supra-renal capsule of a foetus at 9th month; kidney is lobulated, and capsule one half the size of the kidney.

S. 29. The kidney and supra-renal capsule of a foetus at 9th month, showing the interior of each.

S. 30. A human kidney injected.

S. 31. A cast of a human kidney.

S. 39. The genital organs of a cavy, (*Cavia cobaia*.)

S. 40. The testes of a seal, (*Phoca vitulina*.)

S. 41. The testes and penis of a rat, (*Mus rattus*;) the former are of large size as well as the vesiculæ seminales.

S. 42. The testes of an armadillo.

S. 43. The testes of a monkey.

S. 44. The penis and bladder, &c. of a monkey, showing the large vesiculæ seminales, and the prostate divided into two lobes.

S. 45. The vesiculæ seminales of an ox injected with mercury, showing their small size.

S. 46. The penis, bladder, and testes of a seal, (*phoca vitulina*), the os penis is exhibited in the dorsum of the penis; there are no vesiculæ seminales; the membranous portion of the urethra is long and muscular.

S. 54. The human testis.

S. 56. The tubuli seminiferi of the human testis, exposed by raising the tunica albuginea.

S. 57. The arteries of human testis injected, showing the tunica vasculosa testis.

S. 58. The vas deferens, epididymis, and body of the testis, injected with mercury; a diverticulum is seen rising from the tail of the epididymis.

S. 59. The vesiculæ seminales of a human subject, injected with mercury.

S. 60. The epididymis of a man, partly injected with mercury.

S. 61. The vesiculæ seminales of a man inflated and dried.

S. 65. The bladder and urethra of a man laid open to show its interior; the corpus spongiosum is injected, and corpora cavernosa are detached

S. 66. The penis and bladder of a man dried; the penis is injected with wax, and the vesiculæ seminales with mercury.

S. 67. The human corpora cavernosa injected with wax and dried.

S. 68. A section of the corpora cavernosa of a man, inflated and dried.

S. 69. A section of the human corpora cavernosa preserved in turpentine, to show the septum pectiniforme.

S. 70. A section of corpora cavernosa, to show its artery injected.

S. 71. A section of the corpus cavernosum penis of human subject preserved in spirit.

S. 77. A preparation to show the testes at the third month.

S. 78. A preparation to show the testes and gubernacula of a child at sixth month; they are still contained within the cavity of the abdomen; the gubernacula are raised on a bit of blue paper.

S. 99. Ovaries of *echinus esculentus*, five in number, are seen in F. 140; they lie in the space surrounding the intestinal canal.

S. 100. The uterus of a hedgehog, (*Erinaceus Europeus*), inflated and dried.

PATHOLOGY OF THE URINARY AND GENITAL ORGANS.

T. 1. A horseshoe kidney from a boy, otherwise well formed; it lay across the lumbar vertebræ, and is formed by the union of the two kidneys; the line of union is still perceptible: three arteries enter it, one large in the centre, and one small at each extremity.

T. 2. A kidney with enormous enlargement of the urethra and infundibilum, which is divided into three calices above: there was not any obstruction in the ureter below, so that it is probably a congenital malformation; the kidney is otherwise well formed.

T. 4. A specimen of morbus Brightii injected; the cortical substance is vascular, but the tubular is pale and uninjected: the kidney was more solid in texture, and very rough on the surface.

T. 6. A section on an encysted kidney; the exterior is covered with round cysts, many of which are of a bluish colour; the interior shows that the entire structure of the kidney was converted into a mass of cysts, most of which are about the size of a filbert.

T. 7. A kidney containing one large cyst, the size of an orange, situated in the pelvis, and several very small ones on its anterior surface, partly buried in its substance; they each contained a pellucid fluid, and were unconnected with the ureter.

T. 8. A kidney which contained a large abscess; the entire substance is converted into a reticular tissue, and the infundibulum is considerably enlarged.

T. 9. A kidney presenting a large cyst on its anterior surface, which contains a turbid fluid; it is flaccid, as if half filled with bluish fluid.

T. 20. The bladder of a boy who laboured under disease of the vertebræ, (Potts' curvature, see D. 16;) it is not much altered in structure; the uvula is enlarged and its coats thickened.

T. 22. The bladder and urethra of a man who suffered from a stricture of the membranous portion of the urethra: the bladder is much hypertrophied, and has a honeycombed appearance; the orifices of the prostatic ducts are very much enlarged.

T. 23. A bladder considerably hypertrophied.

T. 24. The bladder of a man who died of injury of the spine; the mucous membrane is ulcerated, and hangs in shreds in some parts, and was of a dark red colour in the recent state; the walls of the bladder are very much thickened, and its cavity contracted.; there is an abscess in the prostate gland.

T. 25. A specimen of slightly enlarged prostate gland; the lobes are nearly equally enlarged: the bladder is very much dilated, but otherwise healthy.

T. 30. The bladder of a man operated on for retention of urine, caused by enlargement of the prostate gland; both lobes of the gland are enlarged, especially the right, and a fungus mass projects from the surface of the trigone, which was highly vascular, when recent. The bladder is of about the size of a goose's egg, and reticulated on the surface. The man died one month after being tapped above the pubis for retention of urine, and the urine for that length of time passed by means of a canal, about three inches long, which opened above the pubis; this canal is marked by a piece of bougie in the preparation.—Donor, Dr. Babington.

T. 31. A bladder which contains a large sacculus behind the prostate; this is separated from the prostatic sinus by a transverse fold of mucous membrane: nine calculi were lodged in the sacculus. (See next preparation.)

T. 32. Nine calculi taken from the last preparation; sections have been made of two of them, showing a very small nucleus of a dark colour, and concentric layers of a greyish-white colour.

T. 34. Three prostatic calculi, taken from the next preparation : one of them is as large as a filbert ; they are of an irregular form.

T. 35. The prostate gland and part of the bladder of a man. The prostate is completely hollowed out, its structure destroyed ; it contained the calculi, T. 34. The vesiculæ seminales were atrophied, empty, and opened on the ulcerated surface, at the bottom of the prostatic sacculus.

T. 39. A calculus removed from the bladder of a pig ; it is rough on the surface, and its section shows concentric laminæ.

T. 40. A small calculus, found adherent to the mucous membrane of the bladder of a female : the bladder was otherwise healthy.

T. 41. A cast of a calculus, removed from the bladder of a boy by Mr. Auchinleck ; it presents a kidney shape.

T. 42. A jar containing a renal calculus of a very irregular shape, and three vesical calculi.

T. 44. A specimen of hypospadias ; the urethra opens by a small triangular aperture, capable of admitting a fine probe, situated below the natural orifice. The natural opening presents its normal appearance externally, but does not communicate with the urethra : the glans is small, and the prepuce and frenum are deficient at the lower part.

T. 61. Hydrocele of the tunica vaginalis. The testis is seen at the bottom of the sac, and the vas deferens on its posterior surface.

T. 62. The tunica vaginalis testis, united to the tunica vaginalis scroti by several bands of lymph, (probably a cured Hydrocele :) the testis is slightly enlarged.

T. 66. Lipoma testis : a fungus of a red vascular appearance is seen protruding through an opening in the scrotum : the body of the testis is not enlarged—removed by Dr. Woodroffe.

T. 67. Hydatids of tunica vaginalis testis : three small ones are attached to the head of epididymis, and another to the upper part of the testis ; one of them hangs by a long neck.

T. 68. Sarcocoele ; the body of the testis is converted into a solid fleshy mass.

T. 69. Scrofulous testis : the gland is remarkably heavy and large, being four inches and a half long, and three and a half broad : the surface of the testis is smooth, and free from any irregularity ; the epididymis is not to be distinguished from the body of the testis.

T. 70. Lipoma of the testis, (a section ;) a large fungous mass

protruded from the body of the testis: the preparation shows the interior, injected with vermilion, except in three places where masses of yellow lymph were deposited; the patient had been salivated for the disease without effecting a cure: I tried to inject the testis with mercury, but the vas deferens was impervious.

T. 71. Medullary sercoma of testis: the gland is considerably enlarged, and a section shows the interior entirely converted into a soft brain-like substance; on the back part is seen an ulcerated surface without fungus. It was removed by Dr. Woodroffe; but the man died of enlarged glands in the abdomen about six months after the operation.

T. 72. Atrophy of one of the testes of a rat.

T. 73. The genital organs and bladder of a rat; a small calculus is attached to the neck of the bladder.

T. 80. Cancer scroti.

T. 81. Cancer scroti; removed by Dr. Neligan: a large fungous mass of an irregular aspect is attached to the skin and sub-cutaneous tissue.

T. 90. An enormously enlarged ovary: the surface presents a mamillary appearance, and the interior a fibrous structure.

T. 91. A human ovarium, containing in a cyst a mass of hair and fatty matter mixed up together.

T. 92. A mammary tumour, about the size of the spleen, taken from the broad ligament of the uterus: it presents a soft smooth texture, and appears to be homogeneous in its interior.—Donor, Dr. Jameson.

T. 93. Three masses of ossific matter; one of them is the size of a small apple and nearly spherical, taken from the broad ligament of the uterus: they are very hard, and composed of large irregular cells in the interior.

T. 94. Fibrous tumours attached to the uterus.

T. 95. A fibrous tumour in the fundus of the uterus: it is about the size of a small apple.

T. 96. Cancerous ulceration of the uterus: the cervix and part of the body is totally destroyed: the ulcerated surface is jagged and uneven.

T. 97. A large ossific body, taken from the broad ligament of the uterus, a section has been made; this shows that it is composed of a mixture of fibrous and ossific matter.

T. 100. A mass of acephalocysts discharged from the uterus; they are all attached to a common pedicle, and are small semi-transparent vesicles, varying in size from a pea to a mustard-seed.

T. 103. A mass of fibrine of red colour discharged from uterus, in a case of Dysmenorrhœa.

T. 105. Prolapsus-vaginæ: the vagina is protruded presenting numerous transverse rugæ; its orifice is irregularly transverse and very much puckered; the uterus is seen behind the bladder in situ.

T. 110. A section of an enormously enlarged Clitoris, removed by Mr. Auchinleck. The tumour weighed five pounds, and is of a firm nearly fibro-cartilaginous structure; the upper part is somewhat smooth, but the lower part is covered with hard wart-like processes; it was attached by a narrow pedicle. The woman said that she had received a hurt on the front of the pubis about 18 months previously; she recovered after its removal without any bad symptoms.—(See a cast of the tumour Z. 7.)

EMBRYOLOGY.

U. 1. The chrysalis of the papilio brassica, in the act of emerging from its pupa case.

U. 2. A jar containing the larva, chrysalis and perfect bee.

U. 3. A series of tadpoles, (*Rana temporaria*.)

U. 3*a*. A tadpole with round body, short tail, and external branchiæ.

U. 3*b*. A tadpole with long tail and small rudimental hind legs.

U. 3*c*. A tadpole with long hind legs and tail; the fore legs are concealed, but fully formed under the skin.

U. 5. A tadpole dissected to show the intestinal canal and the branchiæ.

U. 6. A tadpole, the intestinal canal of which has been dissected and unravelled to show its length.

U. 9. An enormous tadpole of the Jakie, (*Rana paradoxa*,) undergoing metamorphosis. The posterior extremities and the tail are seen without dissection; the skin is removed to show the anterior extremities, gills and rudimentary lungs; the liver and intestinal canal are also exhibited. The anterior extremities are small but fully formed, so as to be ready to appear on the next moulting, they are marked by a bit of red bristle; the rudimentary lungs are raised on a bit of gold leaf, and the tuft of the gills are placed on a bit of blue paper; on the undissected side a bit of blue paper is passed through the opening by which the water reached the gills.

U. 13. A chick on the 2nd day of incubation.

U. 14. A chick on the 3rd day.

U. 15. A chick on the 5th day, to show the heart and allantois.

U. 15*a*. A chick on the 6th day within the membranes, the omphalo-mesenteric vessels are well seen.

U. 16. A chick on the 9th day of incubation; the brain and spinal marrow are laid open.

U. 17. A chick on the 19th day of incubation; the yolk-sac is seen partly within the abdominal cavity.

U. 18. A chick on the 21st day; the yolk-sac is seen within the abdomen.

U. 19. A chick on the 6th day after birth, to show the remains of the yolk-sac, about the size of a pea, and the vitello-intestinal duct; all the abdominal viscera are seen in this preparation.

U. 25. Fœtal calf in its membranes.

U. 26. Fœtal calf dissected to exhibit the heart, intestines, &c.

U. 27. Fœtal calf dissected to exhibit the stomach and intestines.

U. 32. A very small human ovum contained in its membranes.

U. 35. An aborted ovum and embryo at about the fifth week; the decidua vera, the villi of the chorion, and the amnion are seen; the latter is laid open to show the fœtus. The umbilical vesicle is also exhibited on the outer surface of the amnion, and marked by a red bristle.

U. 38. An aborted embryo and ovum: the embryo is about an inch long, its head is large and its eyes well formed and surrounded by an orbit, but it has no eyelids; the external ear is badly developed, and the mouth is a broad transverse slit about three-tenths of an inch long. Its superior extremities are divided into arm and forearm, and the lower into thigh and leg; the fingers and toes are small

round tubercles. The embryo, attached by its umbilical cord, is seen lying in the amnion, which has been laid open; and the umbilical vesicle, about one-tenth of an inch in diameter, is also exhibited on the outer surface of that membrane.

U. 42. A human foetus about the 12th week, dissected to show the heart, lungs, thymus gland, liver, intestines and testes.

U. 44. A human foetus at the 6th month, dissected to show the heart, lungs, thymus gland, liver, kidneys, testes, and the gubernaculum testis of one side, within the abdomen.

U. 45. Foetal heart, to show the foramen ovale and the ductus arteriosus.

PATHOLOGY OF THE EMBRYO.

V. 49. A frog of full size with two upper extremities on the left side; the anterior one is very small, the posterior is of the normal size—it is otherwise well developed.—Donor, Dr. Corrigan.

V. 50. A kitten with two pair of posterior extremities; one pair is natural in size and position, the other is small and attached to the right side of the abdomen. The left upper extremity has ten toes, and is evidently formed by the union of two upper extremities, the right one is normal; the face is atrophied, but the head is well formed.

V. 51. An umbilical cord constricted to the size of a crow quill—Dr. Jephson.

V. 52. Spina bifida in a foetus of seven months. The spinous processes of the five lumbar vertebræ are deficient, so that the canal, for a large oval space, is only covered by a red delicate membrane continuous with the skin, and very much puckered round the edges. The child was otherwise well formed.—Donor, Dr. Mitchell.

V. 53. The head of an anencephalous foetus; the body and limbs of which were perfectly developed.

V. 55. The skeleton of an anencephalous foetus; the upper part

of the frontal, the entire of the parietals, and the squamous portions of the temporal and occipital bones, with the great wings of the sphenoid bones, are all absent. The bones at the base of the cranium are well developed and exposed externally, (viz., the wings of infratemporal and body of the sphenoid, the petrous portions of the temporal, with the basilar process and posterior margin of the occipital foramen.) The bones of the upper part of the face are very small; this gives an unnatural preponderance to its lower part, which is well developed, especially the lower jaw bone; the other bones of the skeleton are normal.

V. 56. A foetus of seven months, affected with spina bifida and deficiency of the bones of the cranium, the extremities, thorax and abdomen being well formed. The spinous processes and laminae of all the vertebrae are absent, and the spinal marrow only covered by a thin reddish membrane continuous with the skin on each side. The brain is contained in a bag of dura-mater; the neck is so much bent back that the external ear is pressed between the top of the shoulder and the malar bones; the face is large and looks upwards; the eyes appear unnaturally large from the absence of frontal bones; the nose is flattened and its orifices slit-shaped; the mouth is large and open so as to exhibit the tongue and the gums of the upper jaw.

V. 60. A foetus, the subject of a most remarkable arrest of development of the parieties of the thorax and abdomen, by which means the heart and most of the abdominal viscera are exposed; the heart is completely external, and was seen to beat for one hour and fifty minutes. The sternum and thorax are perfect on the right side, and on that side respiration was carried on, but in a very imperfect jerking manner; the left lung slightly projected below the left auricle, and is covered by the pleura, which is continuous with the serous layer of the pericardium and with the peritoneum. The colon is seen to the left, the small intestine to the right; the colon is not larger nor wider than a crow-quill in any part of its extent, except at its sigmoid flexure, where it presented its natural development. The entire liver is seen externally, the umbilical vein entered on its upper surface, but it terminated in the ordinary manner by joining the porta, and giving off a moderately well-formed ductus venosus. The lobulus spigelii is nearly two inches in length; the kidneys, suprarenal capsules and testes were seen in part externally. The diaphragm on the right side is nearly perfect as far as the vena cava,

from that point to the œsophageal opening it is deficient, except a few irregular muscular fibres to the left side; the brain was both normal in size and structure; the spinal marrow was also normal, but the sixth, seventh and eighth cervical nerves of the left side were very small and imperfect. The thymus gland (see U. 63,) lay under the skin of the neck.—Donor, Dr. Mitchell.

U. 61. The lungs and kidneys of the last foetus: the lung of the right side is nearly normal, but that of the left is only one-fifth of its natural size, and quadrilateral in shape, without any subdivision on its surface; however, on making a section, the division into lobes is observed in the interior. The left kidney is very large, and extended from the fourth rib to the iliac fossa; it is quadrilateral in shape, and had the supra-renal capsule on its anterior surface. The right kidney is much smaller, and had the supra-renal capsule lying on its upper and outer surface.

U. 62. The bones of the shoulder and arm of the last foetus. The scapula is well developed, and normal, except a slight obliquity of the glenoid cavity; the humerus has an upper articular surface, small, but normal, the bicipital groove being rudimental: the lower extremity of the humerus is connected by cartilage with the fore-arm, without any appearance of a regular joint. The fore-arm is composed of a single bone, which presents neither the head of a radius, nor the olecranon of an ulna; the fore-arm is permanently flexed on the arm, and a triangular muscle keeps it in that position, probably a pronator teres: the hand consisted of a single carpal, metacarpal, and three phalanges of one finger, the last phalanx being covered by a hooklike nail.

U. 63. The thymus gland of the same foetus; it is about the size of a large horse-bean, very irregular, hollow behind, and convex in front.

U. 80. The lungs of a full grown foetus, with four lobes on each side, otherwise well formed.

U. 81. The skeleton of an adult foot with six toes: there are only five metatarsal bones, but the fifth is considerably expanded at its anterior extremity, so as to form two articular heads, to each of which is attached a well-formed toe, but the sixth is shorter and thicker than the fifth; the tendon of the extensor digitorum communis is connected with the fifth toe. The other foot presented a similar deformity; taken from a well formed man.—Donor, Dr. Corrigan.

NATURAL HISTORY.

- X. 1. Hydatids from the peritoneum of the axis deer.
- X. 2. *Cysticercus tenuicollis*.
- X. 3. A cysticercus partly in its sac.
- X. 4. A cysticercus *tenuicollis*.
- X. 7. Two lerniæ branchiales from the gills of a cod.
- X. 10. *Ascaris lumbricoides*, male, from the human subject.
- X. 11. *Ascaris lumbricoides*, female, from the human subject, larger than the male.
- X. 12. *Ascarides*, from cat's intestine.
- X. 13. A portion of the intestine of a cat, with ascarides lying in perforations of the intestine, made by shot.
- X. 17. Common tape worm, (*Tinea solium*), from a human subject.
- X. 20. A sea urchin, (*Echinus esculentus*), the viscera exposed.
- X. 23. A grasshopper locust *viridis*.
- X. 24. A *bubrestis sternicornis*.
- X. 25. A *cantharis vesicatoria*.
- X. 28. *Scolopendra morsitans*.
- X. 33. *Scorpio afer*, (Scorpion.)
- X. 39. A *pholas candida* laid open, to expose its foot, by which it assists in boring.
- X. 44. A sucking fish, (*Echeneis remora*.)
- X. 52. Frog, viscera exposed.
- X. 53. A chameleon, (*Lacerta chameleon*.)
- X. 54. The digestive, respiratory, circulating, and urinary organs of the chameleon exposed, in another preparation.
- X. 57. A serpent dissected, to show the thoracic and abdominal viscera.
- X. 59. A tortoise dissected, to show the organs of respiration, digestion, and generation.
- X. 61. A small phial containing four snakes.
- X. 71. A dried flying fish, (*Exocetus volitans*.)
- X. 84. The dried skin of a bat, (*Vespertilio murinus*.)

CASTS.

Z. 1. Double hernia in a male subject.

Z. 2. A cast of a tumour of the thigh, which was afterwards attacked with fungus hæmatodes. See R. 61.

Z. 3. Luxation of the fore-arm upwards and backwards.

Z. 4. The superior extremity of a boy—presenting a remarkable resemblance to that of a *seal*.

Z. 5. A cast of Potts' curvature of the spine.

Z. 6. A cast of a malignant polypus of the nose.

Z. 7. A cast of an enlarged clitoris. (T. 110.)

Z. 8. A cast of the human brain.

Z. 9. A cast of hypertrophy of the liver.

Z. 10. A cast of the arm of a gentleman.

Z. 11. Cast of a tumour situated above the clitoris, which resembled a sub-pubic hernia in many respects; it contained a foetid serous fluid—prepared by R. Butcher, Esq.

Z. 12. Cast of a tumour in the parotid region—prepared by R. Butcher, Esq.

Z. 13. Cast of a liver affected with cirrhosis.

Z. 14. Cast of a spleen affected with hypertrophy, from the same subject as the last cast.—Donor, Dr. Neligan.

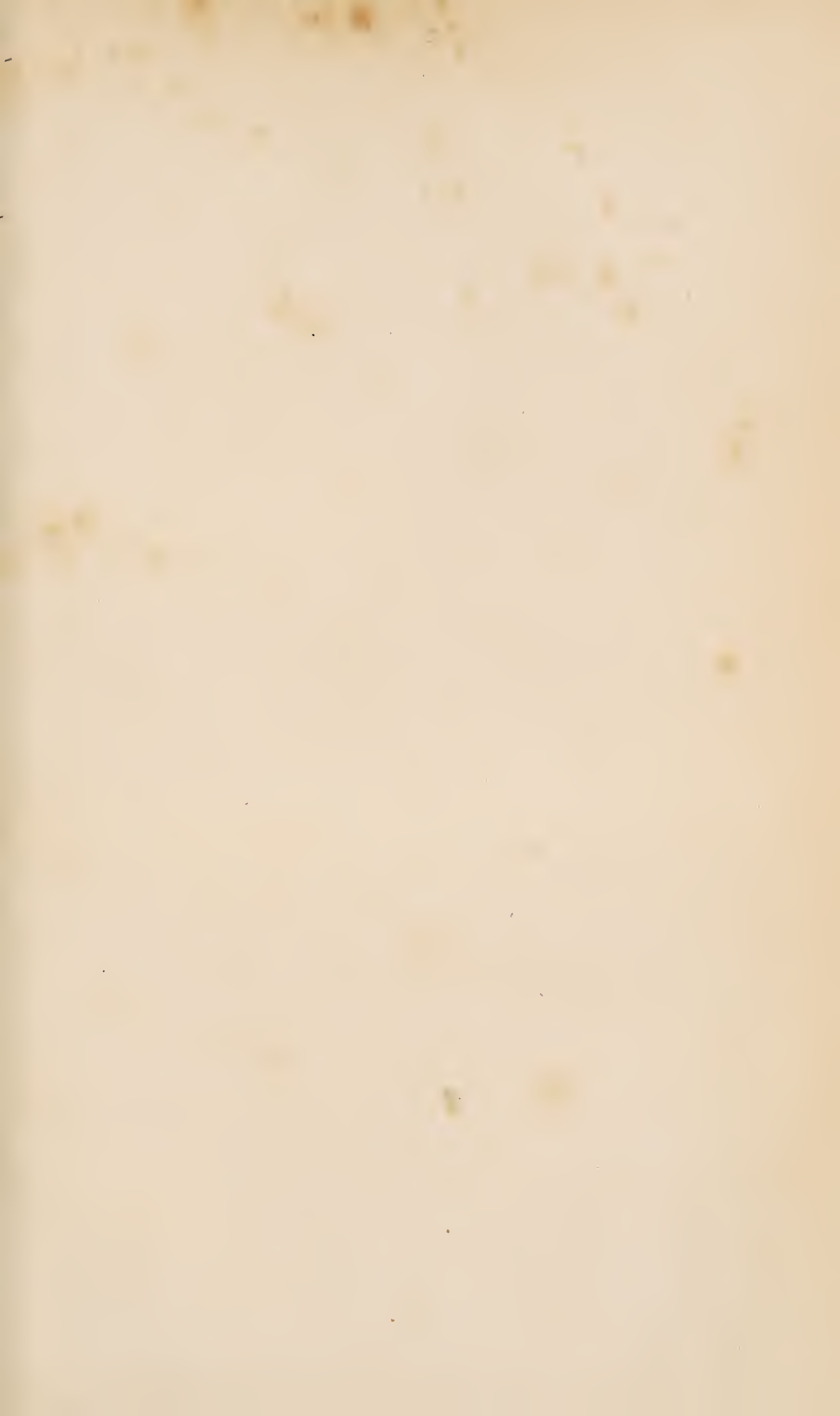
Z. 15. A cast of Collis's fracture of the radius.—Donor, Mr. R. Smith.

Z. 16. A cast of a case of congenital deformity of the fore-arm and hand of a woman; it is three inches shorter than the opposite one; the wrist is dislocated forwards; there is a considerable oblique projection of the radius and ulna on the back of the wrist, and a corresponding depression, but not at all so well marked in front of the fore-arm; the woman has very imperfect use of the hand.

Z. 17. A cast of a fracture of the humerus immediately above the elbow-joint; the deformity resembles the luxation of the elbow backwards.

Z. 18. A cast of a case of oblique fracture of the external condyle of the humerus, with luxation of the radius and ulna upwards and backwards on the dorsum of the humerus, carrying along with them the external condyle of the humerus; the coronoid process of the ulna was lodged in the depression at the back of the humerus; and the joint immoveable; the ends of the bones were removed, and the bones placed in proper position, and the arm very much improved.

FINIS.



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